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ABSTRACT

The ten papers, divided in two parts, focus on a number of basic child development concepts that appear to have some application to the education of young children with special needs and describe characteristics of young exceptional children. Entries include the following titles and authors: "Human Development and the Process of Education" (N. Anastasiow); "Current Issues in Early Childhood Development and Some Implications for Teacher Training" (F. Horowitz); "Cognitive and Perceptual Development in Children" (W. Rohwer, Jr.); "Some Limitations Upon Spoken and Written Language Learning and Use" (F. Smith); "Early Childhood Social and Emotional Development--Relationships and Task Orientation" (C. Heinicke); "Prevention and Remediation of Learning Disorders through Early Childhood Compensatory Education" (H. Spicker); "Preschool Intervention for the Disadvantaged Child--A Challenge for Special Education" (D. Weikart); "Early Childhood Special Education for Hearing Handicapped Children" (D. Moores); "Implications from Education of the Visually Handicapped for Early Childhood Education" (C. Nolan); and "Early Childhood and Special Education for Children with Social and Emotional Disturbances" (F. Garfunkel). Each paper is preceded by an introduction. (SBH)

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Children with Special Needs: Early Development and Education

Editors:

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M.C. Reynolds (Ed.). *Futures of education.* (Winter 1978)

Teacher education for mainstreaming: A casebook on school-college collaboration. (Winter 1978)

The papers contained in this volume represent a new venture in developing training programs for teachers to effectively facilitate the learning of exceptional children, especially those with learning and behavioral problems. The volume is also a testimony to the long standing commitment of the National Center for the Improvement of Educational Systems and its forerunner, the Bureau of Educational Personnel Development to increased opportunities and improved education for young exceptional children within the setting of the regular school systems of the country.

This new venture can best be described as an exploration of the knowledge base in both early childhood education and special education that is necessary to the development of the training content and design for teachers who bear responsibility for facilitating in a single setting the learning of children who collectively may manifest a wide range of differences, whether emotional, social, cognitive, or physical. The undertaking is predicated upon the acknowledgement that professionals in both fields must share their disciplines in order to identify those essential areas that must be brought together for the teacher.

A first step has been taken by the various contributors to this volume. Others who share the same concerns for exceptional young children, will take up, I hope, where the others leave off and continue to refine training designs for this purpose.

I would like to express my appreciation to the directors and panel members of the Special Education and Early Childhood Education National Leadership Institutes, as well as to Dr. Edward Martin and his staff from the U.S. Office of Education, Bureau of Education for the Handicapped, for their support. Dr. Howard H. Spicker, who, with the assistance of Dr. Nicholas J. Anastasiow and the support of Dr. Walter L. Hodges (former director of the Early Childhood Leadership Training Institute), actually developed the workshop and conference that generated these papers, deserves particular recognition. A special commendation for maintaining the effort to bring together the two disciplines of the Bureau of Educational Personnel Development.

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In the last 15 years, both special educators and child development specialists have engaged in program development and research with preschool-age children. Special education groups started their work with educable mentally retarded children, child development groups, with disadvantaged and economically deprived youngsters. In recent years it has become clear that although the two groups often were programing for children with similar problems, each group was working without benefit of the knowledge which had been accumulated through research and scholarly experience by the other group.

The purpose of this publication is to narrow the communication gap that seems to exist between professionals whose expertise is in child development and those whose expertise is in special education. Thus, the presentation is in two parts; the papers in the first part focus on a number of basic child development concepts that appear to have some application to the education of young children with special needs; the papers in the second part focus on the characteristics of young children with special needs. Each paper is preceded by an introduction.

We would like to express our gratitude to the Leadership Training Institute/Special Education and its director, Dr. Maynard C. Reynolds, for undertaking the publication of this collection of papers. In recent years the LTI/SE has been engaged in the dissemination of knowledge across disciplines to enlarge the capacities of both special and regular educators to work with handicapped children and children with special needs. We are proud that this book is now a part of that literature.

We would also like to acknowledge the contributions, both implicit and explicit, of all the participants in the workshops held in 1972, where these papers were initially presented and discussed. And we extend our

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Sylvia W. Rosen was the technical editor.

Howard H. Spicker
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In reviewing the impact of the field of child development upon education, Anastasiow provides in this chapter an essential perspective on the theme of the book. His summary of current trends and major developments in child development that relate to classroom practice, particularly the discussions of the developmental theories of Piaget and Gagné, are a concise introduction to the specific inquiries of Horowitz, Rohwer, Smith, and Heinicke. Horowitz, like Gagné, is more behaviorally oriented while Smith and Rohwer are more cognitively oriented, like Piaget. Although Heinicke is very behaviorally oriented in his data collection, he draws his hypotheses from the psychoanalytic tradition of Anna Freud.

Anastasiow points out that whereas the theories of Gagné and Piaget are quite different, still there are similarities in their perceptions of adult reasoning as developing through hierarchial stages. In his own research and teaching, Anastasiow draws upon the work of both Gagné and Piaget; his attempts to synthesize the two theories are directed to the improvement of classroom instruction of young handicapped and nonhandicapped children.

Human Development and the Process of Education

Nicholas J. Anastasiow

Indiana University

Historical Overview

The study of human development and psychology has had a curious history in education. Its initial impact was based on hypostheses derived from the Freudian notion that the child is the father of the man or that adult neuroses are based on infantile developmental dysfunctions in socialization. Today, this Freudian premise has been fully subsumed in a cultural analysis of behavioral knowledge. By and large, most adults in today's society accept the influence of childhood experiences on adult functioning.

The field of human development had a major impact on education during the 1930s when findings from child psychology were implemented widely in the schools, particularly by the progressive education movement (Cremin, 1961). However, as time elapsed the discoveries of the 1930s and 1940s were absorbed into the culture and came to be viewed by the majority of the middle class as only common sense statements. "Good old child development" was appreciated but perceived by many as a "hearts and flowers" teaching approach of love and permissiveness rather than the specific training of children. The major point is that during the 1950s, because its content was becoming widely known to the populace at large and its premises were being accepted gnerally as common sense, the field of human development, despite its growing body of research knowledge, lost its full impact on education. To give the general more specificity, some examples follow.

During the 1920s and 1930s, educators strove to change the image of the disturbed or troubled child from "bad" to "troubled" or "hungry" or "disturbed" boy, and they were largely successful. Research by Shirley (1931) and Hilgard (1932) clarified the importance of maturation on such functions as using scissors, buttoning coats, riding tricycles, and so forth. Gesell (1954), Havighurst (1952), and others demonstrated that as a child matures he is able to perform more and more of the tasks parents and teachers expect of him, such as the self-help skills of feeding, tieing shoes, and so on. Similarly, dynamic psychology made a major breakthrough in helping parents to use positive child-rearing practices. The image of the child who cannot perform a task was changed from "obstinate" to "underdeveloped."

During the 1940s and 1950s, middle-class mothers and some fathers received massive training in how to raise a child through such influences as the masterful *Baby and Child Care* (Spock, 1946), *The First Five Years of Life* (Gesell, Halverson, Thompson, Ilg, Castner, Ames & Amatruda, 1940), and nursery school classes, PTA meetings, newspaper articles, and films. It could be maintained that these efforts were largely successful in changing the historical image of the child from that of miniature adult to developing or at least maturing organism.

The new generation who profited from the cultural impact of these training procedures took the offerings of human development classes for granted. I remember as a teaching assistant, the repulsion by a class of Stanford undergraduates of the then-dominant child development text which was reputed to be excellent; they asserted that it had no new content. The authors of the text, obviously not recognizing that the content was generally known, had restated their case to the point of absurdity.

One aspect of the problem was, as Anna Freud (1965) stated, that psychoanalysis promised parents too much too quickly. In addition, psychoanalytic insight was predominantly drawn from work with abnormal adults. Child psychoanalysis, while recognizing the importance of the early years, produced little research on Freudian assumptions. In his summary of research related to Freudian theory, Sears (1951) demonstrated how little data was available to support Freud's notions.

At the same time, a parallel growth of a different nature was occurring in education psychology. Influenced by Thorndike, educational psychologists were emphasizing research rigor and methodology. Little data were available to justify most of the assertions made about early childhood education, and the available data on nursery schools were seriously criticized by McNemar (1940). This lack of research evidence undermined many intervention and nursery school efforts. It was only after the publication of Hunt's (1961) book, *Intelligence and Experience*, that educators started to question the notion that IQ was fixed and the definition of intelligence. Skodak and Skeel's (1949) and Skeel's (1966) demonstrations of adopted children's intellectual and social gains in comparison to those who remained in orphanages gave the fields of child development and early childhood education increased academic respect.

Hunt's work probably did as much to initiate and stimulate the development of intervention programs for the young child as any other single work, with the exception of Bloom's (1964) volume which indicated that perhaps 80 percent of a child's cognitive development is completed by 3 years of age.

Equally influential was the work of a group of special educators who were demonstrating that handicapped children could accomplish far more than was previously presumed possible (Kirk, 1958). Haywood (1967), summarizing these findings, found strong supporting evidence for the relation of functional deficits to the absence of appropriate environmental stimuli during critical periods of a child's development. It would appear that the common cord binding together the disciplines of early childhood and special education was composed of assumptions and knowledge derived from child psychology and child development.

A glance at Mussen's new edition of *Carmichael's Manual of Child Psychology* (1970) would convince anyone that one book cannot speak to all the issues. This book is designed to sample from the field and present some examples of work with children.

Current researchers in child psychology are adding substantially to our knowledge about how children grow and learn. Many persons would date the revival of interest in child development to the launching of Sputnik and the Woods Hole conference, reported in Bruner (1960). The nation's concern for excellence caused educators and psychologists to focus once again on the developing child to find the roots of cognitive and affective processes. Piaget's theory and work were "discovered," Bijou and Baer (1961) wrote the first "radically" different book on child development, and academicians from many fields suddenly became educators. These activities resulted in a decade of research that vastly increased our knowledge about the very young child (Horowitz, 1975).

Today, we are at the point where educators recognize that the

field of child development has changed and has something very real to offer classroom practice. However, we are also at the point where transitions and dissemination must be made from the known.

Current Major Trends

Cognitive Growth: Piaget

The early work in child development resulted in a definitive description of a child's motor growth and physical accomplishments. Little attention was focused on cognitive processes related to thinking. Although Piaget had been writing for four decades, his work had little impact on American psychology until the 1960s and 1970s. Initially, Piaget's work was not accepted by research psychologists; they rejected his observational approach as nonscientific. However, once his theory was interpreted by Flavell (1963) and Hunt (1961), educators found much to match their own intuitions about children's capacity for thought. Piaget's great insight was that children do not think like adults but, rather, go through distinct stages of development which are characterized by particular modes of thinking. Hundreds of studies and experiments have been generated by Piaget's theory and they have largely supported his position.

Piaget's is a theory of action. He posits that from the moment of birth the child is the active interpreter of the environment. Through his actions upon the environment and interactions with people and things, the child builds internal schemata which become the bases for thought. He constructs his thinking through *assimilation* and *accommodation*. Assimilation is the process by which the child takes into his mode of thinking the awareness of aspects of the environment. Accommodation is the process whereby the child, when confronted with something he cannot understand, revises his internal schemata to fit his observations. Piaget believes that each child, using these primitive action schemata, grows through orderly, nonreversible, hierarchical modes of thinking. Progress from stage to stage is based on the child's discovery of how things in the world work (e.g., conservation of mass and volume). The child is said to make these discoveries through his own experiments with and observations of the environment. Piaget's basic premise (the child's need to transact with the environment for learning to take place) is essentially the position of Dewey (1963) and Bartlett (1958). Today, this position is a core construct of cognitive psychology and is well presented by Neisser (1967) and Norman (1969).

Piaget postulated an additional process which he termed *decentering*. He maintained that the child at birth is undifferentiated from his mother and the environment. Gradually, he develops a concept of separate self. Decentering is the lifelong process whereby the self is created as a separate and distinct object in the universe.

The stages of development proposed by Piaget (1971) follow. All ages are only rough approximations; some children master each stage early, some later. To know that a child has made the leap to the next stage, one must be sure that he is able to perform consistently and in a nonreversible fashion the thinking operations characteristic of the new stage. Some aspects of intelligent thought begin very early. For example, size consistency is begun at 6 months but does not fully mature until the child is 10-12 years of age.

1. *Sensori-motor Period: Birth to 2 years of age.* During this period, the child constructs all of the cognitive substructures that are the bases of thought and perception. These same substructures are used later for the development of more sophisticated thought. At

first, the child lacks symbolic representation; however, by noting consistency of size and form, the behavior of objects (rolling, bouncing, turning, etc.), and the properties of objects (weight, size, shape, color), the child moves into the next period of representational intelligence in which most of sensori-motor intelligence is reconstructed.

2. *Pre-conceptual Thought: Ages 2 to 4 years.* Speech begins during this period and the child makes rapid progress in learning names for objects and using speech to communicate. According to Piaget, the child's language mirrors his thought processes and his language is only as sophisticated as his experience and thinking skills. In other words, cognition precedes language development. Language, however, facilitates the acquisition of social knowledge. Social knowledge, to Piaget, is all knowledge that deals with the names of things and all arbitrary language conventions of a particular culture ("dog" in English, "hond" in Dutch). During this period, the child masters an increasingly large set of concepts and further differentiates his cognitive processes. Piaget felt that much of the child's learning during this period is accomplished by imitation, symbolic play, drawings, mental images, and verbal evocation of events.

3. *Intuitive Thought: Ages 4 to 7 years.* This stage is characterized by the mastery of more complex forms of language. In addition, basic laws of physics and chemistry (conservation of number, mass, etc.) are brought under control.

4. *Concrete Operations: Ages 7 to 12 years.* During this period, the child masters the system of reasoning which is operational in nature. He now possesses a stock of basic concepts and has organized them into a coherent system of thinking. He can deal with aspects of logic including, in part, classes, number, relations, closure, and reversibility.

5. *Formal Operations: Ages 11 to 15 years.* To Piaget, the hallmark of human intelligence is abstract reasoning; it is mastered during this stage. Now the child can deal with the calculus of propositions and utilize the "either-or" and "if-then" forms of reasoning in a consistent and irreversible manner.

The implication of Piaget's theory for educators is marked, although it should be made clear that Piaget did not necessarily direct his theory toward teaching. Rather, he described the manner in which children learn and the capacity for various forms of thought at different ages. Curriculum planners following Piagetian theory carefully select the material to be introduced according to the child's age-stage of thinking. In addition, guided discovery methodologies are stressed rather than a heavy emphasis on didactic teaching. (See Anastasiow & Mansergh, 1975, for a more complete description.)

Behaviorist Approaches: Gagné

Social learning and behavioral theorists tend to reject the notion of the child as a transactor who takes in the environment. Generally speaking, they see the child as a responder to the mass of stimulation around him in his world. Although it is an oversimplification, the behavioralist would posit that all cognitive and affective processes are built initially by a basic system of reinforcing acceptable responses or ignoring or punishing unacceptable ones.

To be sure, the behavioralist recognizes that the infant can process environmental stimuli. Behavioral research has shown without a

doubt that the human brain can be activated for learning from the time of birth. Lipsitt's experiments at Brown University (Lipsitt, Kaye, & Bosack, 1966) have demonstrated that 1- and 2-day-old neonates can discriminate among shapes and colors when rewarded for doing so. Children as young as 2 months can discriminate speech from other sounds in the environment.

Reinforcement is a key construct in these experiments. Learning takes place through classical and operant conditioning. For instance, the baby can turn his head; by presenting him with two shapes or objects and giving him sugar water through a nipple when he looks at the "correct" object, he can be taught to turn his head to look at the object the experimenter selects. Bandura (1969) postulated that mechanisms such as imitation, modeling, and discrimination are additional ways that children learn later.

The eminent behavioral educational psychologist Gagné (1965) has proposed a hierarchical theory of the development of thinking. Like Piaget, he believes that learning is sequential and each level must be mastered before the next can be reached. Gagné's system includes eight major steps which must be achieved before the child or young adult can master abstract reasoning (problem solving):

1. Signal learning (classical conditioning).
2. Stimulus-response learning (operant conditioning).
3. Chaining (skill learning).
4. Verbal association.
5. Multiple discrimination.
6. Concept solving.
7. Principle learning.
8. Problem solving.

To Gagné, the major variable accounting for a normal child's mastery of a level is the trainer's skill in presenting the material to be learned in the appropriate sequence for the level at which the child is functioning. Gagné listed eight elements which are keys to the instructional situation:

1. Presenting the stimulus or information.
2. Directing the attention of the learner to what is to be learned.
3. Providing a model of terminal performance.
4. Furnishing external prompts.
5. Guiding the direction of thinking.
6. Inducing transfer of knowledge.
7. Assessing learning attainment.
8. Providing feedback.

The social learning theorists and behavioralists have had a greater impact on the application of behavioral techniques to control negative behavior than on curriculum development in early education programs. However, Gagné's theory has directed the AAAS Elementary Science curriculum, and there are several behavioral early childhood curricula for children with special needs (Anastasiow & Mansergh, 1975).

The debate between the cognitively oriented and behaviorally oriented psychologists is far from settled. The vigor of the controversy has produced research of a diverse nature. The field can only profit from such efforts. In no other area of developmental studies has the debate been more sharply defined than in language acquisition. Today, however, few behaviorally oriented theories are considered adequate to account for the acquisition of language (Gibson, 1969).

The rapidity with which children acquire the languages of their cultures is of great interest to psychologists, linguists, and educators. The latter have become greatly concerned with language because of the obvious but not fully understood relation between reading and oral language (Anastasiow, 1971).

It is now generally conceded that a child learns to discriminate human speech from other sounds as early as one month of age (Clark, 1973). By 3 to 6 months, a child can be observed responding with understanding to words spoken by a variety of adults. By 2 years, all children, regardless of culture or nationality, begin to use a spoken language of sufficient breadth to communicate.

One of the major puzzles is the similarity in stages of language development of children from different cultures and environments. For example, children of deaf parents begin to babble at the same age as children of hearing parents. Lenneberg (1967) has documented the stages of language acquisition and drawn a parallel with motor development.

Lenneberg noted, for example, that at 6 months an infant in a sitting position can bend forward and use his hands for support. Concurrently, he can be observed changing his babbling to sounds resembling one-syllable words. Lenneberg's analysis documents the progression of motor and speech accomplishments at similar age periods of children, regardless of culture and language spoken in the home.

Most English-speaking children master the sounds of English by age 5. However, current evidence indicates that most normal children do not master double consonants in medial positions (as in the word "twelfth") or final position sounds until around age 8. In addition, children tend to associate words in a different fashion from adults. Whereas adults usually associate words of the same class (table-chair), children, until 8 years of age and after, associate words of different classes, usually by function (table-eat). Further, children do not begin to understand words in a psychological sense (such as "hard" in "hard head" or "hard heart") until early adolescence. Some psychologists believe that the use of words in the psychological sense (with the exception of the word "sweet") is not begun until late adolescence and not completed until adulthood, and may be a lifelong learning.

Thus, language does not constitute the source of logic, but, as Piaget would maintain, is structured by it. Language assists children in focusing on what we want them to learn ("see the doggie") and helps humans to organize their thoughts. In addition, language is a faster means of communication than nonverbal means.

The fact that all children acquire language at the same age encouraged the hypothesis that language is innate and thus each human possesses a language acquisition device (*LAD*) by which the specific features of his culture's language are acquired. However, even the most extreme nativist does not deny that children have to learn a particular language--English children are not born speaking English, for example.

In a provocative study, Nelson (1973) demonstrated that children who acquire early language rapidly are those who come from homes in which the mother accepts the child's attempts at verbalizing names of objects or persons, where there is low TV watching, and where there is frequent interaction with adults outside the home. An important result of Nelson's work is the support it provides for the position of the cognitive psychologist and linguists (e.g., Piaget, Slobin) that a child learns what a thing is before he learns the word for it. Moore (1973) supported this position strongly and suggested that basic cognitive processes may guide the development of language.

Affective Development

Comparatively little knowledge exists concerning the affective development of preschool children. This void appears to be more a reflection of the difficulty of handling constructs such as self-esteem or self-contempt than a lack of interest in the subject.

One approach has been Kohlberg's (1963) construction of a theory of moral development based on Piaget's notions. Kohlberg proposed six stages, each with a different basis for moral behavior.

1. The punishment and obedience orientation.
2. The instrumental egoism and exchange orientation.
3. The interpersonal concordance or "good boy-nice girl" orientation.
4. The "law and order" orientation.
5. The social contract legalistic orientation.
6. The universal ethical-principle orientation.

Other researchers, such as Anna Freud (1965), see several lines of development, including body independence, emotional self-reliance, companionship, and work orientation. A. Freud (1965) listed the stages of the child's transition from dependency to emotional self-reliance and adult-object relations as follows:

1. The biological unity between the mother and infant.
2. The part-object or need-fulfilling anaclitic relationship.
3. The stage of object constancy.
4. The ambivalent relationship of the pre-oedipal phase.
5. The completely object-centered phallic-oedipal phase.
6. The latency period.
7. The preadolescent prelude to the "adolescent revolt."
8. The adolescent struggle, resulting in object relation with the opposite sex outside the family.

One of the most widely accepted theories of personal development was advanced by Erickson (1950). It involves the following steps:

1. Learning trust vs. mistrust.
2. Learning autonomy vs. shame.
3. Learning initiative vs. guilt.
4. Learning industry vs. inferiority.
5. Identity vs. identity diffusion.
6. Intimacy vs. isolation.
7. Generativity vs. stagnation.
8. Integrity vs. despair.

Each of these proposals holds promise for the future. Cognitive and affective processes are viewed as separate systems but few educators would deny their interrelation. One example is of particular note: In Nelson's study (1973), children who had difficulty making parents understand the word they produced for an object exhibited temper tantrums, withdrawal from the field, and depressions. Thus, in the first year of life, learning frustrations can produce major affective responses by the child.

Summary

Developmental psychology and education are alive and well in 1976. There appears to be a national awareness of and readiness for early childhood and infant programs. Unfortunately, financial support is only minimally available at the federal level. We are at a

point where knowledge is far ahead of practice. Our knowledge of the importance of infant stimulation is minimally applied within those populations whose citizens reside in poverty with concomitant inadequate health care, food, housing, and employment (Birch & Gussow, 1970), although we know, for example, that with the exception of physical damage the effects of perinatal stress can be completely overcome, given favorable economic conditions and positive child-rearing practices (Werner, Bierman, & French, 1971). Mothers' child-rearing strategies can do much to facilitate or hamper the children's development (Broman, Nicols, & Kennedy, 1975).

Recent child development research has resulted in a renewed interest in individual differences and the manner in which a child matures from an undifferentiated global state to an adult who can deal with abstract reasoning. Both Gagné and Piaget posit thinking as sequential and hierarchical, requiring rich environments for mastery to take place. Piaget, it is suspected, would have the teacher point out relevant highlights and encourage discovery. Gagné's method is very similar although it is drawn from a different theoretical base.

Not all adults engage in abstract reasoning (Langer & Kuhn, 1971). It is suspected that the reason they do not is more because of inadequate teaching procedures than genetic constraints. Didactic methods can only take the child so far. One can only hope that the field of development will continue to consider the child to be the center of the learning process rather than the product.

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Horowitz's chapter explores current issues in early child development to clarify the need for explicit models of teacher preparation. The focus is on three major issues: the rapidity of infant development, the need to be very specific in our analyses of ethnic and cultural differences, and the problems of teacher training.

Much can be gained from an examination of the arguments made by both Horowitz and Weikart with respect to those variables that may prepare persons for teaching (Horowitz) and maintain the quality of teacher-child interactions (Weikart). Together, these papers offer some very clear guidelines for both preservice and inservice teacher education. If, as is argued in the introduction to Weikart's chapter, the teacher is the curriculum, then it becomes essential for any institution (teacher preparation agency, child-oriented school, or day care center) to heed the messages delivered by these two authors.

Dean Horowitz, the editor of the very fine publication, Volume IV of Review of Research in Child Development, and current editor of the distinguished Monographs of the Society For Research in Child Development, has an exemplary knowledge of the field; this chapter highlights recent research findings and their potential impact on child rearing and teacher training.

Current Issues in Early Child Development and Some Implications for Teacher Training

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A great deal of effort, money, and interest has become available in recent years as our troubled country has sought solutions to one of its most pressing social problems: the tremendous waste of human resources. Too many potentially normal and contributive children from impoverished homes grow up to adulthood to take their place in the vicious poverty circle. For millions of these children, hope and destiny center on the teacher, the model of education, and the curriculum to which they will be exposed. There is a tide of belief that failure in the public school classroom may be prevented somehow if only the developmental course of the children can be changed through early educational experiences. "Breaking the poverty cycle" has become the cliché; early childhood education has become the panacea. Thus, the field of early childhood has been given a unique opportunity.

The children with whom we are concerned have been variously referred to as "poor," disadvantaged," culturally deprived," "stimulus deprived," "subcultural," and "urban minority" (Horowitz & Paden, 1973). The phrases vary with the changing rhetoric of our times to mirror, in the most serious sense, our basic confusions over what it is we are about and, in the least serious aspect, our desire to use those words that, at the time, accurately depict a sensitive understanding of the issues underlying proposals for early intervention programs. Although we have long recognized the necessity of intervening early to help handicapped children compensate their natural difficulties, only recently have the early education needs of nonhandicapped children become a focus of concern.

One serious response to the needs has been to encourage thinking about the criteria for effective teacher training in terms of either training program content or behavioral competencies that should be reliably demonstrated by a certified teacher. Our certification programs are purposely and perhaps helpfully vague. However, were we to train doctors with as much romanticism as we often train teachers, we would have little confidence in the medical care they could provide. We ask for a doctor to diagnose and treat problems reliably. Can we not ask for the same of a teacher? Can we train teachers to this criterion?

In this chapter, I am concerned with the issues and areas that are of current interest in the field of child development and the relations of these issues and areas to the training of teachers of young children. Thus, a number of topics are discussed; some may seem at first to be only weakly connected but, together, they form a theoretical foundation upon which it may be possible to build effective teacher-training programs. The remainder of this chapter is divided into three sections which can be summarized as follows:

1. The development of the young child is quite dramatic. We do

not yet fully understand how (s)he rapidly acquires new behaviors nor do we totally understand the significance of some of these behaviors for later learning and development. The possibility that the young child picks and chooses which parts and how much of the environment (s)he responds to may significantly affect how and when we intervene with young children. Some of the terminology that may be useful in helping us to analyze early development is also discussed.

2. After a brief examination of the nature-nurture argument, there is considered the importance of analyzing cultural and ethnic differences that may determine which procedures will and will not be effective in educating young children. The necessity of a systematic and functional analysis of learning becomes a basic tenet.

3. Attention is given to the problems of teacher training and the scarcity of good research on how to train teachers effectively. The possibility is considered that early childhood education may well fail if it continues to rely upon a basically unsystematic approach to teacher training and teaching children.

Behavior Change in Young Children

That the young child from birth through 8-9 years of age is a rapidly developing organism is now a commonplace observation. It is a summary statement of the fact that the whole spectrum of responses the young child is able to make is continually changing, and the number and complexity of the responses are expanding. Change also occurs in the kinds of errors the child makes. We see a vivid collage of behavior undergoing continued change in both texture and density. Whether regarded from a Piagetian cognitive point of view, a Gesellian developmental perspective, a Freudian analytic frame, or a behavioristic approach, there is no doubt that, as time passes and development progresses, the history of the child's acquisition of the response repertoire takes on an increasingly functional significance in determining the plasticity of any current given repertoire.

Simply put, the important point is that the more extensive the history of response acquisition, the more important it is that one take into account the existing responses used by the child when we arrange new learning experiences for her/him. Consider how easily many very young children acquire fluency in two distinctive languages in contrast to the stresses and pains that accompany the learning of a second language by high-school or college-age students. The conclusion is not that we become more resistant to new learning as we grow older but that the learning situation is different at different points in development. If we are going to teach new responses effectively we must systematically take into account the existing response repertoire of the individual who must learn. Yet, second language teaching, typically, pays little attention to these considerations. Some widely acclaimed successful techniques literally bombarded the student in order to overwhelm the interference of her/his existing repertoire. Students with a so-called "natural flair" for language acquisition past their mother tongue may, in fact, be interesting examples of individual differences in the degree to which they can inhibit the interference from their other language(s). This admittedly speculative notion about second language acquisition may provide a relatively noncontroversial analogy in the rather controversial matter of ethnic and cultural differences in learning, which is discussed later in this chapter.

A second point about how new behavior is acquired covers the ways we use the concepts of maturation, conditioning, and early stimulation in thinking about development. Behavioral development in the young

child appears to occur very rapidly and with such regularity, for most children, that it is easy to use the concept of maturation to *explain* what is happening when, in fact, the concept only *describes* what is occurring. The notion of maturation does not explain the mechanisms that control development. As has been pointed out elsewhere (Horowitz, 1968), the term is usually used when we do not know the process accounting for behavioral change. We usually assume that physiological changes, controlled by environmental, genetic, and biological factors, are at work. But how these factors are translated into behavioral patterns, and what feedback mechanisms of stimulation from the environment are simultaneously requisite for changing the behavioral repertoire, are only dimly understood (see Ambrose, 1969; Connolly, 1970).

That the human organism is conditionable at birth is now well documented (Fitzgerald & Porges, 1971; Horowitz, 1968; Lipsitt, 1969). It is not totally clear, however, whether the way the child learns in the natural environment is similar to the way learning happens in the laboratory. Most people find it difficult to believe that parents and caretakers are as systematic in the reinforcement of behavior as seems to be necessary in the laboratory. But it is possible that we do not have to think about conditioning happening only in contrived laboratory-like situations. The basis of learning under conditions of reinforcement may involve some sort of informational feedback from the environment. If one watches the behavior of infants and very young children it is apparent that the child induces a great deal of his/her feedback stimulation from the environment by his/her behavior. The child pushes, pulls, and in all ways makes things happen. And these things happen systematically with great regularity. Systematic changes are not rare; they are *frequent* phenomena for all children.

Thus, if such stimulus change acts as immediate feedback (reinforcement) it may be that the minimal conditions for conditioning to take place are abundantly available in the natural environment. (See Horowitz, 1969, for a fuller discussion of this idea.) Interest in the plausibility of this point of view seems to be growing (Walcher & Peters, 1971). Laboratory studies of conditioning, rather than representing *contrived* models, may, in fact, represent controlled cases of events that occur with great frequency in the complex natural environment. Indeed, it is possible that we do not yet understand all the supportive environment conditions necessary for stable conditioning to take place, and that conditioning is much more effective and efficient in the natural environment than in the laboratory.

Early environmental stimulation has been extensively discussed because environment is thought to account significantly for individual, social, and cultural differences in the development of young children (e.g., Bloom, 1964; Fowler, 1968; Kagan, 1970). Also, the experimental literature on the effects of early environmental stimulation on animal behavior is both extensive and convincing (e.g., Levine, 1969; Mason, 1970). Hebb's (1949) proposition that early learning lays the foundation that determines the degree to which later learning can occur has been a theoretical mainstay of advocates of early stimulation programs to prevent later learning problems. Hunt's (1961) significant revival of the nature-murture issue with respect to intelligence added further impetus for such a conceptual framework. And it was this line of thought that became the ideological mainstay of most early intervention programs (Horowitz & Paden, 1973).

Although many advocates of early stimulation stress environmental effects, much less attention has been paid to the significance of early individual differences and the genetic and biological factors that may determine the relative effectiveness of early stimulation for different organisms. In one of the best brief discussions of this subject, Ginsburg (1969) pointed out the complexity of the relations that

determine the effects of early stimulation, and he noted that individual differences in both phenotype and genotype strongly affect the outcome from similar stimulation experiences for different organisms. Ginsburg reported, for instance, that the aggressive behavior of one mouse strain was most affected when handling occurred during the full duration of the preweaning period, but for another strain the same effect could be gotten only if handling occurred during the last two weeks before weaning. He also noted that for clear behavioral entities like aggression or convulsive seizures the patterns were extremely complex. It is going to be even more difficult to understand fully the interaction between environment and heredity for characteristics such as intelligence. One might also add that human genetic pools are considerably more complex than pure mouse strains.

If maturation is an unsatisfactory refuge for understanding how early development happens *and* we are concerned with knowing the effects of early stimulation in human development, there are serious difficulties. Systematic genetic manipulation among humans is not a viable option. Yet, knowledge of the differential effects of early stimulation on development is crucial to the planning of environments for individual children and, eventually, to teaching teachers how to program such environments. One has only to look at the individual differences apparent in newborn infants to appreciate the extent to which children differ right from birth.

Several studies by students working in my laboratory have suggested the persistence of individual differences observed at birth over the first few months of life (Ashton, Note 1; Self, Note 3). Looking at the behavior of infants 3-4 days of age with the Neonatal Behavioral Assessment Scale (Brazelton, 1973), one is impressed with the variation in the degree of responsiveness to visual and auditory stimulation, in the tendency to sustain attention as opposed to brief attending behavior, and in the relative ease or difficulty of keeping in contact with the infant.

Our work has led us to consider the following assumptions as a fruitful base for our research efforts: (a) Children differ in responsiveness to different stimulus dimensions in the environment. (b) A prerequisite condition for learning is maintaining contact with the environment which is controlled by either caretakers or self-regulatory mechanisms. In other words, if a caretaker cannot attract and maintain the infant's attention, the caretaker is less likely to be relevant to the shaping of the infant's behavior. And, perhaps equally or more important, the natural, biological, or constitutional characteristics of low responsiveness to environmental stimulation reduces the opportunities for self-controlled environmental interaction (discussed above). In both cases, the frequency of opportunities for behavioral shaping diminishes with the possible consequence that not only are some behavioral repertoires not adequate for later learning but, as the child increases in age, this problem becomes more and more detrimental to later acquisition in the typical classroom.

The lack of attention, paying attention, and attention span (or keeping in contact with the environment) are among the most often used teacher complaints about individual children. If the child does not learn and the teacher can say the child does not pay attention, the teacher can feel absolved of further responsibility for the problem. That we typically do not train teachers to analyze systematically this frequent problem so that (s)he can manipulate attending behavior in order to have learning proceed, is a significant statement about usual programs of teacher education.

In sum, several lines of consideration have emerged in this section with respect to the processes that determine whether children learn. One involves the issue of the amount of interference or facil-

itation for later learning occurring as a function of the kind of early learning the child has done. Another point is the viability of a basic conditioning model to account for behavior and the likelihood that the child's own behavior plays a significant role in controlling her/his learning. If the child's behavioral possibilities partially depend upon the amount, kind, and characteristics of the environment, then providing appropriate early stimulation becomes an important consideration. If individual differences in responsiveness to different aspects of environmental stimulation determine the effects of early stimulation, the basic data on individual differences become very important. Each of these points is supported by a little bit of data and a lot of speculation, suggesting, obviously, that continued basic research on them is essential if we are to achieve the goal of insuring optimal development for every child born into our society.

Individual, Ethnic, and Cultural Differences

Providing the opportunity for optimal development for every child has an appropriate democratic ring. The statement, however, not only is a substantive challenge but raises both moral and ethical issues which must be of serious concern. Despite the allegations of Jensen (1969, 1971), Herrnstein (1971, 1973), and Eysenck (1971) that 20 IQ points are 20 points and therefore we must begin to develop alternate educational programs for genetically depressed subgroups in our population, the implications are not nearly as clear-cut as these authors would have it. (a) One can seriously question Jensen's arbitrary division of tests that measure intelligence into those that reflect a large genetic component and those that reflect achievement. (b) One can also question the use of subpopulations such as "Negro" and "Mexican-Americans" to represent clear genetic strains. Genetic backgrounds, especially in this country, are so intermixed that they defy the investigator seeking genetically controlled groups. (c) It is possible that hereditary factors will be found to control some aspects of intellectual development; indeed, it is unlikely that biological and genetic factors do not play an important part in information processing and storage. However, the current test and genetic data are not sufficient to warrant the broad and sweeping conclusions made by Jensen and others. (See Scarr-Salapatek, 1971a, 1971b, for a fuller discussion.) (d) The data base used by Jensen and others has been brought into serious question.

It is not at all unreasonable to suggest that a fruitful approach to understanding how behavior is learned involves a thorough understanding of individual differences in relation to the saliency of various dimensions of environmental stimulation (e.g., Lesser, Fifer, & Clark, 1965). In addition, thorough understanding of the processes whereby subcultural groups communicate different value orientations with respect to environmental variables would be extremely helpful. Some of these processes may be extremely subtle but significant, as is evident when a member of a majority culture moves to a different country and suddenly becomes a minority member in the majority culture there. The gross and sudden change to which the person is subjected is typically described as culture shock.

The problem faced by a scientist caught up in the controversy over intelligence and heredity is that the question is typically posed in such a way as to suggest that one is scientific only if one accepts the black-white IQ differential. (And for all practical purposes the data have been phrased primarily as demonstrating a black-white difference.) If one does not accept the Jensen-Herrnstein-Eysenck thesis one is seen as being influenced by egalitarian values and thereby discarding scientific objectivity. It is possible to accept the idea

that there is hereditary control over some portion of intelligence yet, at the same time, seriously to question the conclusions that are based upon incomplete data organized according to often arbitrary and erroneous assumptions (Horowitz & Paden, 1973).

As Ginsburg (1969) noted, even by working at the gene level at this time we can hardly obtain clean data for clearly defined behaviors such as convulsions. How, then can we expect to make conclusions about a behavior so variously defined as intelligence? Have we not learned our lessons from the attempt to define drive levels and motivation through paper and pencil tests? Behavioral genetics is an important field because it will tell us something about the genetic basis for certain response predispositions. These predispositions may be most of what the organism brings into the world. The rest may reside in conditioning. The shaping of the response repertoire might proceed more systematically and with greater assurance of results if we knew how to identify and use such predispositions. Some parts of the response repertoire may be shaped by physical forces interacting with biologically determined response predispositions. Other parts may be determined by cultural values and expectations interacting with individual differences in various aspects of response predispositions. And the interactions may be additionally complicated by interrelations among different portions of the entire response repertoire.

The continued existence of a culture is most vulnerable in terms of its children--especially its infants. At the same time, an important ingredient for the continued viability of any culture is the maintenance of its language system. Thus, one does not advocate early intervention programs without asking about the implications of such programs for the maintenance and continued existence of the culture in which one is intervening.

At the present time, children eventually must interface with the public school classroom. For some segments of our population this interface is unsuccessful. The most common approach to the problem is to propose that the behavior the child brings to the interface be changed through intervention programs before the child enters the public school classroom. There are two consequences to the solution: (a) Little attention has been paid to changing the characteristics of the classroom side of the interface--especially that of the teacher's behavior; and (b) the intervention programs have produced disappointing results. This second consequence could have been predicted from the unsystematic way in which intervention typically has been attempted. The problem of the child and the educational system is just being moved forward in time to the point of preschool or the beginning of the intervention program, instead of kindergarten and first grade.

There has been some manipulation of curriculum content but little systematic analysis of how the delivery system for that curriculum--namely, the teacher--and the arrangement of the environment can be manipulated to optimize outcome. Perhaps more importantly, there continues to be little recognition that the behaviors brought by the child to the program must be systematically analyzed to determine which of the responses will facilitate and which will interfere with the learning objectives of the program. Until such analysis becomes a basic part of program implementation, many intervention programs will show some effects by accident but little in the way of clear, durable, replicable results.

The process of educating children is widely regarded as an art. As such it is difficult to specify under what conditions particular procedures will work. We hope for talented teachers and bemoan their short supply. But if, in fact, it is possible to make the kind of systematic analyses necessary to understand the processes of learning, then numerous opportunities for developing a technology of education

become available. We will be able to decide at what point formal early education can be provided successfully for what kinds of children and for which behaviors. Is early childhood education necessary in all domains if the public school classroom can be made more effective? Perhaps there are important critical periods for some responses. In this sense, handicapped children are basically a special case of a general problem. We need early identification of children with specific characteristics so that the children may be given the opportunity provided in special environmental programing for the development of a given response repertoire to be assured.

Although public schools have received a fair amount of condemnation for failing to educate children, the schools tend to place the fault in the child, the home, and the family. The resort to early intervention has continued to place the emphasis upon the child as the reason for failure, and has lured us from potentially fruitful analyses of the public school in general and the teacher in particular. The cycle is in danger of being repeated when the judgments are made that early compensatory education has failed. The lack of strong convincing results is not disputable. But the reasons for the failure often are placed in the child rather than in the system delivering the education. And it is to the underpinnings of the delivery system to which we must now turn. (See the chapter by Weikart concerning alternative models used to explain the low achievement of select groups of children.)

Focus on Teacher Behavior

What must a teacher be able to do in order to bring about the behavior changes involved in the process of educating children and helping them develop? If our analyses of the processes of learning are correct, the teacher must know how to assess the child's current behavior in relation to the responses that need to be acquired, and to program both her/his behavior and the environment in such a way as to take the child from where the child is to where the child is to go. It is true that the bulk of our curricular materials for all ages are more or less empirically designed to provide programs. Also, there is much extensive discussion in educational training materials and textbooks about the importance of where the child is, the crucial aspects of individual differences, and the significant role played by the teacher. However, teachers are not sufficiently trained to make systematic response repertoire analyses, analyze important individual difference characteristics or, most significant use their own behavior in precise ways in the classroom.

Overall, the motivation to change this state of affairs is not strong because a certain number of children appear to learn almost despite the teacher, and another group of children learn well enough even with rather unsystematic teaching. In fact, the majority of children do not suffer so noticeably from unsystematic teaching to cause general alarm. The *clearly* handicapped child with specific identifiable deficits is typically subjected to some form of special education. Teaching in special classes is not necessarily much more systematic than in regular classes, except that the teacher may be tuned in to some particular behavioral parameters of the children with whom (s)he is dealing and can make some relevant adjustments in methods.

There is, however, a group of children for whom unsystematic teaching can be a disaster--have far-reaching effects not only for the child but for the society that must absorb the individual. These are the children for whom education results in either no further acquisition or acquisition of a nonfunctional repertoire for continued learning. Under the stresses of a situation that involves the teacher in

repeated failure, a trained teacher who cannot make a systematic analysis of the child's behavior nor alter or control his/her own behavior so that it becomes functional in the learning process is strongly tempted to conclude that the child who *does* not learn *cannot* learn. Thus, the children are classed as disadvantaged, deprived, or disabled with respect to learning ability. Many of these children come from subcultures that are more or less isolated from middle-class America.

If we were doing what the textbooks say teachers *should do* (but often do not know how to do), we already would have good data on the response repertoires that different groups of children from different subcultures bring to the classroom, and we would be busy in the development of programs designed to teach children with these repertoires. Rather, we have pushed the beginning of formal education earlier and earlier but have not changed the tactics: Teachers seek curriculum materials designed for different ages but they fail to make systematic analyses of the response repertoires that the children are regularly bringing to the preschool. The teacher does not systematically control his/her own behavior either in programing materials or reinforcing behavior. Is it any wonder that most compensatory educational efforts have not produced startling results in the acquisition of the behavioral repertoires thought to be necessary for successful public school behavior?

On the other side of the coin, one can ask what we know about training teachers to perform all of the above functions. It actually appears that we do very little research in how to train specific teacher behavior. Picking up at random a recent issue of the ERIC publication, *Research in Education*, almost 50 entries under "Teacher Education" were scanned. There was clearly one or possibly two abstracts that would qualify as *research* on training teacher behaviors.

At the University of Kansas, some faculty in the Department of Human Development have conducted a series of studies concerned with how we train teacher behaviors that change child behaviors (Thomson, Holmberg, & Baer, Note 4). They reported several interesting results: Some of the more popular techniques, such as observing master teachers, appear to have little functional effect on changing a student teacher's behavior. The studies strongly support the utility of employing teacher-training procedures that use behavior analysis and modification techniques. No matter what the content of any curriculum, the question of training teachers to behave precisely and effectively is one of the central and most valid concerns in education.

Child development has something to learn from the education of handicapped children because of the greater effort to define the response repertoire of children with specific handicaps. In some cases, specific programing and the training of definite teacher behaviors has progressed well beyond the typical child development orientation for preschool teachers. Yet, such an approach has not been generally used for effective formal education programs for children who have individual, ethnic, and cultural differences. In principle, the situation is no different except that, eschewing a value judgment about such differences, there is no reason to think of the children as handicapped. The differences call for expert and systematic teaching, especially where there are important differences and similarities between the response repertoires the children have and the ones they must acquire. We know that the chance of interference is high if the responses to be acquired are quite similar to those that the child has but have important distinctive features. In these cases, extremely careful programing must be done. One might hypothesize that *only* very systematic and controlled teaching will be successful under such conditions.

In addition to the children with ethnic and cultural differences, there are children who will benefit from early detection of response characteristics that are different enough to be important for consideration in programing environments, but not obvious enough to be taken into account under normal casual conditions of observation. In all these senses, these issues in child development are the significant ones for basic and applied research in developing an adequate technology of teaching.

There is a growing recognition of the needs of such an emphasis (Becker, Englemann, & Thomas, 1970; Ramp & Hopkins, Note 2; Ramp & Semb, 1975), and the next decade should be an especially fruitful one. In the meantime, we dare not fail to educate another generation of minority group children. The peril of such a possibility involves a cost beyond our imagination. The basic issues in child development are no longer academic. They require the fullest appreciation of what we do not yet know, but the deepest sense of responsibility to use what we have for effective education. There is nothing more discouraging than to see unsupported assumptions about training teachers and teaching children take precedence over demonstrably effective techniques. Serious social consequences will result if our efforts help to maintain a triumvirate of myths: teaching is an art, children don't (can't) learn because the children and the families are at fault, and all we need is love. We know more than these myths though less than we need to know.

Success in early childhood education will contribute significantly to our society; failure will be disastrous. That is why the arguments about training teachers and effective curricula can no longer be thought of as academic playthings. An educated populace is the heart of a democratic society. We will lose democracy more surely by failing to educate effectively than by any other process. Rarely have the stakes been so high. Only the willingness to follow the data will insure a truly responsible effort.

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In this paper, Rohwer presents four major issues that are currently confronting researchers in child development and early childhood education, and he discusses and analyzes the basic assumptions upon which some of today's most controversial positions are based.

Rohwer has been deeply involved in studying the capacities of young children. In previous papers, for example, he has argued that low socio-economic status (low-SES) black children are capable of achieving the same degree of school success as high-SES children. He suggests that they do not so achieve because (a) low-SES black children come to school with less developed learning tactics; (b) although the low-SES child improves in the first grade, skills are not sufficiently developed over time to become lasting; and (c) these children have not mastered the skills that are needed to learn under group or classroom conditions. These arguments are important in considering the chapter here, particularly in view of Rohwer's concluding statement--that the school tasks required of <u>all</u> young children can be mastered only with a great deal of emotional and cognitive support.

Given that the majority of those children who are classified as retarded come from low-SES groups--particularly Chicano and black--it is thought provoking to consider the degree to which middle-class children are trained and supported by parents to meet and survive successfully the demands of early schooling. Parent-training research efforts are based on the notion that it is the parent who provides the necessary stimuli at appropriate stages for the child's successful development. But Rohwer raises the question of whether we should not also reexamine the tasks that all children are required to learn and the appropriate times at which they should be learned.

Cognitive and Perceptual Development in Children

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Some of the issues, beliefs, and data that claim the attention of psychologists who investigate the development of perceptual and cognitive processes are surveyed in this chapter. The coverage is not comprehensive; instead, it is aimed at highlighting topics that are relevant to the concerns of persons responsible for educating children with special needs. Thus, the presentation begins with a consideration of general issues about the character of development, reviews the present state of knowledge about developmental changes in specific categories of behavior, and concludes by drawing out the implications of this survey in the form of propositions that may serve as guidelines for the design of programs and provisions in special education.

The Character of Cognitive and Perceptual Development

At present, psychologists take divergent positions on a number of general assumptions about the character of cognitive and perceptual development. Four of the major issues relate to nature-nurture, maturation-learning, continuity-discontinuity, and critical periods. Although they overlap to a considerable degree, each issue has educational implications of sufficient distinction to warrant separate consideration and, therefore, each is considered in turn.

Nature-Nurture

An intriguing aspect of the nature-nurture issue is that it lends itself to misstatement, as exemplified by the question, "How much of intelligence is determined by heredity and how much by environment?" Such questions wrongly presuppose that *within* an individual some portion of a trait is due to heredity and another portion, to environment. On the contrary, the nature-nurture issue relates to the proportions of variability in a trait, *across* the individuals in a population, which can be attributed to the genetic differences in the population and to the environment in which the population is found.

Given an appropriate formulation of the nature-nurture issue, the particular aspects that are in dispute and those that elicit substantial consensus can be specified. There is little disagreement with the proposition that *within* well-defined populations (e.g., U.S. citizens of third generation, northern U.S., white parentage) variability in behavioral traits, such as IQ, is partly attributable to corresponding genetic variability. Instances of agreement on this point are easy to come by; for example, within populations, some groups of persons are designated familially retarded. Even in this case, however, it must be emphasized that an explanation of variability of IQ in terms of

corresponding genetic variability does not imply that the performances used to index the trait are fixed and impervious to improvement. Obviously, persons who are called retarded learn a wide variety of skills, and the levels of performance they achieve depend importantly on learning conditions. Thus, even if a trait is substantially attributable to genetic variability, a fixed ceiling on performance is not necessarily implied.

Among the unresolved topics surrounding the nature-nuture issue are two that have provoked substantial interest. One is that the heritability (proportion of behavioral variation attributable to corresponding genetic variation) of many, many behavioral traits is almost completely unknown, principally because the necessary investigations have not been made. The case of intelligence-test performance is exceptional in that a variety of methods have been applied to determine its heritability within populations. By comparison, virtually no effort has been expended to estimate the heritability of concept learning, verbal memory, problem-solving behavior, and so on. These gaps in our knowledge of the heritability of behavioral traits are enormous but, in time, they may be closed since there is considerable consensus on the methods appropriate for doing so.

In contrast, another topic in the nature-nurture domain and one that arouses the most intense controversy cannot be managed in such a straightforward manner. In a series of publications, Jensen (1969, 1973a, 1973b) suggested the hypothesis that differences *between* as well as *within* populations are attributable to corresponding genetic differences. This hypothesis has stirred dispute at a variety of levels, partly because there is little consensus on the kinds of methods that are appropriate for evaluating the hypothesis, and partly because of deep disagreement about the content of the hypothesis. For example, the hypothesis implies that observed IQ differences between racial and socio-economic populations may be attributable to corresponding genetic variability between the populations. At present, it appears that there is little chance that the problems raised by this hypothesis will be readily resolved (cf. Kamin, 1974).

What are the implications of the nature-nurture issue for educators working with children who, for one reason or another, are educationally handicapped? One implication is clear: Variability across persons in performance on perceptual or intellectual tasks is to be expected. Little else is compelling since, even if behavioral traits were shown to be highly heritable, a fixed ceiling on performance could not be implied. Pending further progress on the issue, the fact of individual differences can best be provided for in intervention attempts by constructing a variety of avenues for the achievement of any given set of objectives.

Maturation-Learning

In most cognitive or perceptual tasks administered to children, the older the child, the higher the level of his performance (Rohwer, 1975). How is such developmental change to be explained? One alternative is to postulate a psychological counterpart to physical growth processes--maturation--and to attribute increasing competence to more advanced stages of growth. Another alternative is to account for all changes toward higher and higher levels of intellectual and perceptual competence in terms of the processes of learning, memory, and transfer. Even though, at present, neither alternative is espoused in pure form by any substantial number of psychologists, the different emphases that both suggest are realized in two of the liveliest current approaches to understanding developmental change (for an extended discussion, see Rohwer, Ammon, & Cramer, 1974).

When the emphases of the two approaches are stated generally, the

difference between them appears to be quite dramatic. Nevertheless, it is not a simple matter to specify that difference in detail or to identify it with particular implications for practice (Case, 1972). For the purpose of discussion, the positions may be identified with illustrative exponents: Piaget, on the one hand, and Gagné, on the other. In Gagné's view (1970), the difference between the position he has promulgated--the cumulative learning model--and that expounded by Piaget is striking in relation to implications for educational practice.

> If growth is the dominant theme, educational events are designed to wait until the child is ready for learning. In contrast, if learning is a dominant emphasis, the years are to be filled with systematically planned events of learning, and there is virtually no waiting except for the time required to bring about such changes. (Gagné, 1968, p. 178)

Ostensibly, this difference is profound. But consider an example: Suppose for some reason, the performance of accurately judging the numerical equivalence of sets of crayons, however they are arranged on a table, is a critical objective of schooling for 5-year-olds. Whether one were a Gagnéan or a Piagetian, he would agree that this specific objective is attainable and that its attainment could be promoted by arranging an appropriate set of environmental experiences. Adherents of the two positions might well disagree about exactly what the set of most appropriate experiences should be, but this disagreement could be settled by empirical test.

Thus, we still face the question: How do the opposing positions differ? One answer is in the interpretation of the meaning of attaining competence on a particular specific task. Consider the case in which learning conditions are systematically arranged to promote the attainment of a particular task performance by a 5-year-old who would otherwise not attain the performance until age 6 or 7. In Gagné's view, such a performance has the same significance that it would have were it attained by the child in the natural course of events. But not Piaget; instead, he would regard precocious attainment as spurious, in the sense that it signifies only the mastery of a particular behavior sequence, not of the underlying competence necessary for successfully attacking a variety of tasks of a similar kind. Thus, a Piagetian might well expect that precocious achievement, made possible through educational intervention, would have little value, or transfer, beyond the particular learning accomplished. It would certainly not have the same significance as attaining the competence through the normal processes of development. In contrast, a Gagnéan would hold that the transferability of learning engineered through intervention would be as great as that of learning that occurred in a normal setting, since the processes involved in both cases are the same; they differ only in that the one (intervention) is more efficient and sure than the other.

At present, this issue in the maturation-learning debate remains unresolved. Indeed, a neo-Piagetian position, recently advanced by Pascual-Leone (1975), promises to sharpen the points of theoretical dispute and, as formulated by Case (1975), to yield far-reaching educational implications as well. Whatever the future of the dispute, it will continue to be of critical importance for educational practice, and especially for educational practice with handicapped children. The question is whether it is beneficial, in the long run, to design programs to accelerate the attainment of intellectual performance objectives in young children or to let the overriding processes of development take their course (Rohwer, 1973a).

Continuity-Discontinuity

The continuity-discontinuity issue turns on the decision of whether to adopt a *stage* conception of the course of development. Examples of such a conception may be found in both Piagetian and psychoanalytic theories (Rohwer, Ammon, & Cramer, 1974). Since both approaches give considerable emphasis to maturation as a major mechanism of development, it is tempting to identify a stage conception with a maturational position, and a continuity conception with a learning emphasis. By and large, this interpretation would be accurate but it need not be so. For example, a developmental theory with a learning emphasis might well include stage conceptions which are defined in terms of the normative kinds of environments to which children of various ages are exposed. It might be postulated that the first stage is the very early part of life--infancy--when the person's environment consists largely of his mother, followed by a stage defined by the immediate family, then by a stage characterized by the increasing dominance of the peer environment. Thus, a decision in favor of a developmental theory that emphasizes learning does not necessarily preclude the adoption of a stage conception of developmental progression.

An advantage of a stage conception is that it provides a summary of the child's capabilities as he matures, presumably allowing the observer or educator to predict accurately what the child can and cannot do if the stage the child has attained is known. Thus, in a Piagetian example, if a child has attained the stage of concrete operations he is able to learn successfully to conserve quantities like number, substance, volume, and the like when the appearance of each is transformed. It would be fruitless, consequently, to expend educational resources and the child's efforts on the kinds of learning that require concrete operations before these competencies have developed. The implication is clear: In order for educational experiences to be productive, they should be designed to match rather than advance the child's developmental level.

In contrast, a continuity approach like Gagné's cumulative learning model cannot provide a general specification of the child's competence from which particular predictions can be made about what he will be able to learn. The model explicitly assumes that a child can learn virtually anything, at any age (apart from the limits imposed by physical growth), as long as he has accomplished the necessary prerequisite learning. The implication here is that, rather than information about a child's developmental stage, the educator needs to know what the child has learned previously.

Another distinction between stage and continuity theories deserves special emphasis. In stage theories, the character of cognitive processes at ascending developmental levels is qualitatively different, whereas in a continuity theory like Gagne's the older child is regarded as having greater intellectual power than a young one simply because he has learned more and possesses more relevant past learning which he can transfer to learning new tasks. It is this capacity for transfer that makes the older child appear to be startlingly more proficient than the younger. This explanation can be extended to other kinds of intellectual differences so that older children, high-IQ children, and dominant culture children can be distinguished from younger children, low-IQ children, and variant culture children in terms of what they have previously learned. A stage conception of development, however, lends itself to interpretation of such individual differences in terms of qualitative differences in the character of the processes that typify the learning and thinking of various types of children at the same age.

To conclude this section, an example is presented of the implica-

tions of a stage position in comparison with those of a continuity position. Suppose one objective of schooling were that second-grade children should be able to design experiments to test predictions about phenomena that involve relations among three or four variables, as in the case of hypotheses about why some objects float in water while others do not. This objective, of course, is very demanding for second-grade children. Accordingly, whether a Gagnéan or Piagetian position were adopted,one would expect that accomplishing the objective would be very difficult indeed. A Piagetian position would lead to the expectation that the objective really could not be attained in a satisfactory way until the children were much more advanced developmentally. They would have to have attained the stage of formal operations before instruction could effectively promote the capability to design experiments. The Gagnéan position, on the other hand, would be that some children in the group might already have met the objective, if they had completed the necessary prerequisite learning, and that the other children could meet it if the instructional conditions were properly designed and the necessary prerequisite learning were accomplished. Thus, a discontinuity position implies that expectations of a child's capability should be derived from an assessment of his stage of development, while a continuity position leads to an emphasis on appraising his previous learning.

Critical Periods

The decision on whether to incorporate the postulate of critical periods into a conception of the mechanisms of human cognitive development has far-reaching implications. Roughly speaking, a critical period is a span of time during which an organism must have experiences of a particular kind if he is ever to acquire certain skills. Such periods are usually located very early in the organism's life span. The reality of the critical period mechanism has been relatively well established for some particular forms of behavior in some species. If the principle is valid for human development, then, of course, it becomes crucial to insure that children, at very young ages, are provided with necessary prerequisite experiences. In an influential book, Hunt (1961) provided support for this proposition, drawing on results of research studies on animal behavior. The possible reality of critical periods, thus, forms one of the compelling bases for recommending very early formal control over the learning environment, as is the case in many programs of early childhood education.

Despite its importance, however, there is, at present, no substantial evidence to support the belief that critical periods are characteristic of human intellectual development (Thompson & Grusec, 1970). Indeed, some developmental psychologists interpret the available evidence in an opposite direction (e.g., Elkind, 1969; Furth, 1970), suggesting that early formal instruction may retard rather than facilitate later intellectual development. Furthermore, other evidence can be viewed as implying that the earlier the onset of formal schooling, the more negative the eventual attitudes toward school, especially among students from families of lower socio-economic status (Rohwer, 1971, 1973a, 1975). Thus, for the moment, the implications of the notion of critical periods for educational design are negligible at best.

The Development of Specific Perceptual and Cognitive Skills

In one sense, a great amount of research has already been completed on the development of specific perceptual and cognitive skills, yet, in another sense, the research has produced only a small amount

of information of direct use in designing specific instructional sequences for special groups of children. Nevertheless, in the amount of space available here, it is impossible to provide an adequate account of the relevant information. (For additional amplification on any of the topics, the reader may consult the three recent reference works used in constructing most of the following summary: Mussen, 1970; Reese & Lipsitt, 1970; and Stevenson, 1972.)

The remainder of this review is organized in terms of the following kinds of specific skills: conditioning, perceptual and discrimination learning, transfer, verbal learning and memory, and concept learning. In a crude sense, the ordering of these topics is from the simpler to the more complex intellectual skills, although psychologists who do research on so-called simpler skills might dispute this continuum vigorously.

Conditioning

Two varieties of conditioning have been identified: classical and instrumental. Both have been shown to occur in very young infants, as young as 1 or 2 days of age. For example, in a study by Siqueland and Lipsitt (1966), the response under investigation was that of head turning. It was demonstrated that repeated presentation of a buzzer along with tactile stimulation of the newborn's cheek resulted in head turning to the buzzer alone. Similarly, the frequency of head turning was increased by delivering a reinforcer, a sugar solution, after the response. Thus, the evidence strongly supports the notion that both forms of learning, classical and instrumental conditioning, are within the capability of the newborn.

Just as both forms of conditioning are available avenues of learning early in life, so both persist into adulthood. With regard to the classical variety, the evidence is not at all solid about developmental changes, but it suggests that conditionability increases from birth to about age 4, either leveling off or decreasing thereafter. The task ahead for investigators in this area is difficult since it is not clear whether those age differences which have been observed are due to capacity, motivation, or sensory thresholds.

Age trends unearthed in studies of instrumental conditioning are also rather sparse. There is some evidence that so-called symbolic reinforcement (praise, tokens, etc.) becomes more effective in promoting learning in the older child, whereas material rewards are more effective with younger children. A similar effect has been reported for the classification factor of SES as well, but in neither case is the evidence sufficiently strong to compel belief. One developmental trend that does seem well established is related to the extent of generalization. The question is, once a child has learned to make a response to a particular stimulus through reinforcement, say a light of certain brightness, how different in brightness must the light be before it will no longer elicit the response? A pronounced relation with age has been found; the older the child across the range of 4-12 years, the less the extent of generalization. Thus, great care must be taken with younger children to insure that the response they learn does not generalize to stimuli for which it is inappropriate.

Perceptual and Discrimination Learning

Like most other intellectual functions, perceptual proficiency generally increases with age. Proficiency in this domain is indexed in a variety of ways, prominently including tasks that require identifying a previously presented stimulus in an array of other stimuli, and recognizing that changes either have or have not been made in

stimuli on successive presentations. These indices have been used in research on perception in several different modalities: visual, auditory, tactile, and the like. The results of an enormous number of studies make fascinating, though very complex, reading.

Early experience (i.e., in infancy) has been shown to have some effect on later perceptual proficiency, and a few studies have shown that enriching the infant's visual field contributes to increased perceptual activity. In contrast to the enrichment studies, the effects of early experience also can be studied with deprivation. Although most such work has been conducted with animals, a small number of studies carried out with human beings has shown, for example, that young children who have been blind from birth are less proficient in tactually perceiving and discriminating shapes or forms than sighted children. This result, however, has not been confirmed for the tactual discrimination of texture.

Another line of perceptual research has centered on the child's ability to detect changes in the orientation of forms on successive presentations. Two such transformations have received heavy emphasis: mirror-image, left-right, and mirror-image, up-down changes. In general, the results show that left-right discriminations are very difficult indeed for children up to age 6 after which improvement is rapid. In contrast, children as young as 3½ years are proficient at detecting up-down transformations. Two methods for improving the young child's ability to detect left-right transformations have been effective. (a) Present the stimuli simultaneously in a vertical array rather than side-by-side in a horizontal array. (b) The performance of kindergarten children on the left-right discrimination can be measurably improved by a training procedure in which they are required to move a lever in the same direction as the orientation of the presented stimulus. Thus, the selection of a response that correlates with the orientation of a visual form can facilitate learning. Such methods are, of course, relevant to the design of instruction to promote prereading skills.

Two other lines of research are especially enlightening about the relation between perceptual learning and reading. The first revolves around a theoretical position in which the concept of *distinctive features* plays a prominent role. According to this approach, improvement in perceptual proficiency occurs because of increasing sensitivity to those aspects of stimuli that distinguish among the several members of a set. For example, letters are sets of stimuli in which certain features (e.g., curve-straight, open-closed) are important for determining the identity of each member. Research using this approach has shown that young children, up to age approximately 7-8, find the task of discriminating such stimuli especially difficult. One helpful procedure for younger children is to present series of complex stimuli that have some components in common while allowing other components--those that are not distinctive features--to vary. The child's task, then, is to detect those complex configurations, for example, four-letter words, that do and do not share the common elements or features.

Still another topic relevant to reading concerns the reputed trend of younger children to be prone to attend to the whole rather than the parts of a visual stimulus, whereas older children focus on the parts as well. If valid, this phenomenon is important because it has been used to support the "look-say" approach to beginning reading. The problem is that the validity of the trend is in considerable doubt. Indeed, the truth seems more closely approximated by the assertion that younger children are less sensitive to perceptual features, whether they distinguish parts or wholes. Accordingly, those features of a complex stimulus that are critical for learning must be emphasized somehow when they are presented to young children, regardless of

whether the features are "parts" or "wholes."

Some research (cited in Reese & Lipsitt, 1970) seems to suggest that the increasing perceptual proficiency of children as they develop across the range of 3-7 years is attributable to increasingly systematic scanning of visual stimuli. Younger children, as revealed by records of their eye movements, characteristicaliy fail to scan the contours and parts of visual stimuli in a comprehensive way; they focus instead on only a few portions of the forms presented. In contrast, the eye movements of older children almost completely reproduce figural stimuli.

A widely known age trend in the domain of perception provides a bridge to the second topic of this section, namely, discrimination learning. This trend concerns differences in dimensional preference. The most prominent example is illustrated by a task in which the child is shown a target stimulus--a yellow circle--and asked to indicate which of two other stimuli--a yellow square or a blue circle--is most similar to the target. His choice is regarded as indicating a preference for either the form or color dimension that describes the stimuli. Much of the available data indicate that there is a marked shift over the age range 3-8 years from color to form preference. The shift is so complete that older children almost never make color choices. For young children, the ordering of dimensions from most to least preferred is color, size, number, and form. For older children, it is form, color, size, and number. Among older children, it also has been found that deaf children prefer the color to the form dimension, whereas hearing children exhibit a preference for form. Despite the apparent regularities in dimensional preference reported here, some caution is warranted in drawing conclusions because of recent work showing that the preferences can be shifted by varying the difficulty of the discrimination required.

Dimensional preferences lead into a summary of work on discrimination learning because the tasks used in this kind of research usually confront children with stimuli that differ on the familiar dimensions just discussed. Typically, the child is asked to learn which of two kinds of stimuli the experimenter has designated as correct and which, incorrect. The two classes may differ in any one or more of several ways. For example, "green" stimuli might be correct, whether they are circles or squares. Given such tasks, some investigators have found that the efficiency of performance depends on whether the critical dimension is one preferrred by the child; if it is, he performs well, if not, he appears to learn very slowly.

Another factor that exerts pronounced effects on discrimination learning is whether the stimuli to be discriminated are presented successively or simultaneously. Simultaneous presentation substantially improves performance, presumably because the child can more readily compare the two stimuli and, thus, become sensitive to their distinctive features--the dimensions on which they do and do not differ.

Perhaps the most interesting age trend observed in the studies of discrimination learning is that proficiency seems to increase in early childhood but then to decrease with later development. For example, 5-year-olds perform better than 3-year-olds, but they also perform better than 7-year-olds, 9-year-olds, and even college students, who perform little better than 3-year-olds. One interpretation of this trend is that the older the person, the less likely he is to believe the experimenter's description of the task. Thus he spends an inordinate amount of time attempting to solve a problem when, in fact, all he must do is learn a discrimination.

Transfer

One of the main purposes of transfer experiments in developmental

research is to reveal what children learn in perceptual and discrimination learning tasks. For example, in one kind of transfer method--transposition--the child first learns to discriminate between two circles that differ in diameter. After he comes to select the larger one consistently, the two stimuli are changed and that larger circle is now presented with a circle that is still larger. The question is, will the child continue to select the same circle or the larger one? The first kind of outcome is interpreted as indicating that the child has learned a simple connection between a particular stimulus and a response, whereas the second is regarded as implying that he has learned a relation--a kind of low-level concept.

Several experimental paradigms have been applied to the problem of determining the age at which children characteristically learn relations, or concepts, rather than simple connections. Some of these are discrimination shift, transposition, and oddity problems. The results of many of these studies lend credence to the supposition that over the age range of 4-7 years children shift from learning simple connections to learning concepts. Several different theories have been formulated to account for this shift but the problem is that conflicting empirical results have emerged; that is, some studies have found little evidence that the shift from associative to conceptual learning is a developmental phenomenon, concluding, instead, that it varies as a function of task conditions, such as whether preferred dimensions are used (e.g., Zeaman & House, 1974).

One final point must be made about performance on discrimination learning and transfer tasks: When a young child is not given instructional assistance, he finds such tasks remarkably difficult. The tasks themselves are ostensibly very easy, at least to the adult eye. For example, suppose a child is confronted with a series of oddity problems. In such problems, each trial consists of presenting three objects, two identical and one different. Since a new set of objects is presented on every trial, the child must learn to choose the odd object. In one such study only 10% of 4-year-olds were able to master the task within 200 trials, whereas all of the 12-year-olds in the sample could do so. Thus, it seem warranted to conclude that young children, especially in the preschool and primary grade range, need substantial instructional assistance in order to learn even what it is that they are supposed to learn.

Verbal Learning and Memory

The tasks typically used in studies of verbal learning in children require the child to recite lists of words that bear only an arbitrary relation to one another. One such task, serial learning, entails learning the exact order in which a list of items is presented. Another, perhaps the one most often used, is called paired-associates. Here the child is presented with a list of word pairs and asked to so learn them that he can remember the second member of each pair when presented with the first. These tasks and others like them have been used to investigate a variety of issues, some of which are relevant to our concerns here.

One such issue concerns the age at which children begin, voluntarily, to elaborate the materials presented for learning. For example, suppose a child is asked to learn the identity of a series of pictured familiar objects by associating the picture with its position on the table. The question is, when do children begin to rehearse the verbal labels of the pictured objects in order to learn? In a series of studies conducted to analyze this issue, the results indicate that simple rehearsal activity emerges in the familiar 4-7-year age range (Flavell, 1970; Kingsley & Hagen, 1969).

In contrast, two complex forms of mental activity, believed to occur when adults learn lists of paired associates, seem not to occur in the absence of special prompting until well beyond the age of 7. These activities may be described as verbal and pictorial, although the exact character of the internal processes involved has not been identified as yet. When asked to learn a noun pair such as *fish-pipe*, adults report thinking, in either words or images, of a fish smoking a pipe. There is little indication that such elaborate activities are characteristic of children's learning before the ages of 12-14 years (Rohwer & Bean, 1973).

Although younger children appear not to engage in these more complex forms of elaborating verbal materials, many studies have shown that the efficiency of their learning can be dramatically increased by presenting the materials in a form that incorporates an external analogue to or prompt for the elaboration. For example, noun pairs can be presented to children in the form of sentences (e.g., The *fish* smoked a *pipe*) or in the form of pictures displaying an event involving both of the objects designated by the paired words. These methods of presenting material have been shown to produce dramatic increases in the efficiency of the child's performance across the range of about 4-14 years of age (see Rohwer, 1973b). Once again, the conclusion suggested is that younger children must receive considerable instructional help--structured support, if you will--in order for them to engage in efficient strategies for mastering intellectual tasks.

In regard to memory, research to date suggests that the major determinant of remembering in adults also operates in children, namely, the degree to which material has been learned in the first place. Suppose two children have learned a list of 10 noun pairs to a point where they can correctly recite all the pairs at least twice in a row. Further, suppose that one of the children required 30 trials of practice in order to reach this criterion whereas the other child required only 10. If both children were tested for their recollection of the list a week later, they would probably remember approximately equal numbers of pairs correctly, despite the initial difference in proficiency in learning the list.

At present, it appears that another major feature of memory in adults is equally characteristic of children. Much of the forgetting experienced by adults is attributed to *interference* from other material that has been learned, either prior or subsequent to the material in question. This same kind of effect is observed in children, suggesting that care must be taken to help the child distinguish clearly between the successive sets of verbal items that he is asked to learn.

Concept Learning

Some of the research and theory related to developmental changes in children's concept learning has been reviewed in connection with the topic of transfer. Accordingly, the attention here is restricted to issues that arise in connection with the learning of more complex concepts, especially the kinds that have been studied as a result of Piagetian theory and observation.

The most popular of the tasks used in recent research on developmental changes in the learning of complex concepts are the so-called conservation tasks. A variety of these tasks has been used, differing in materials, procedures, and, especially, the character of the judgments the child is asked to make. Yet, most of the tasks have a common purpose: to determine when children become capable of judging quantities as equivalent although the materials differ in one or a number of other respects. An example from the conservation of number is the task of deciding whether two sets of five objects are numerically

identical when the objects in one set are widely separated and the objects in the other are bunched together. Research to date seems to suggest that the capability of judging numerical equivalence does not emerge until about age 6, on the average. Equivalence judgments for other kinds of quantities appear to be even more difficult, as the following age estimates indicate (Reese & Lipsitt, 1970): mass, length, and area: 6-7 years; weight: 9 years; and volume: 11-12 years.

There is considerable dispute about both the ages at which these skills emerge developmentally and the mechanisms that account for their emergence. Piagetian theory emphasizes the necessity for the child to attain the ability to engage in concrete operations, including those of class inclusion and reversiblity, before he can accurately make equivalence judgments. Other theoretical approaches emphasize dimensional preferences and developmental changes in the child's inclination to attend to these distinctive features of materials(e.g., Gelman, 1969). Still other approaches, such as Gagné's, postulate the accumulation of specific prior learning as the mechanism whereby the child comes to "conserve" quantity. Finally, some theorists regard the observed age trends as attributable to changes in the tendency to use language as a tool of thinking. Whatever the interpretation, research results in this area, as in the others reviewed, suggest that young children find concept learning and tasks that require the combination and manipulation of concepts to be extraordinarily demanding.

As this review clearly illustrates, we have far from complete knowledge of the development of perceptual and intellectual capabilities in children. Even so, it is possible to discern a few themes that command tentative acceptance as propositions because they recur so often across a variety of theories and a collection of disparate research studies.

1. Massive changes occur in perceptual and cognitive abilities over the age range that defines childhood.

2. Children can learn from systematic experiences at very young ages--indeed, from birth onward.

3. Nevertheless, tasks regarded by adults as relatively simple are of inordinate difficulty for young children.

4. In order to perform many intellectual tasks successfully, young children require substantial assistance at every step along the way.

Taken singly or together, these four propositions have important implications for the planning and conduct of education for young children. Furthermore, their implications bear extrapolation to the case of handicapped children as well. Both carefully controlled experimentation and casual observation suggest that children, from infancy to adolescence, accomplish an enormous amount of learning. One of the mysteries about any particular learning episode, however, is to know exactly what the child has learned. For example, suppose a 4-year-old is rewarded for saying "a" whenever the printed letter *a* is presented to him. From that response we might conclude that he has learned the letter. But, we would probably be mistaken. From what we know about the young child's propensity to overgeneralize, without additional extensive training in discrimination, it is more likely that the child has learned to say "a" to any printed alphabetic character. In contrast, we might easily make an opposite mistake in the case of an older child. We might, for instance, assume that repeated exposures to the letter *a* in lower-case type is sufficient for the child to learn to recognize the letter, not only by itself, but in the context of a wide variety of words as well. The likelihood is that he will have learned instead that *a* is *a* only when presented singly. In both cases, the failure of the adult is twofold. (a) a failure to under-

stand that learning the letter *a* to adult standards is a demand that the child learn a concept; and (b) a failure to recognize the characteristic propensities of younger children and how these propensities differ from those of older children.

Another major implication of the four propositions is that many of the kinds of learning expected of young children in school are well beyond their reach. Adults rarely demand that 6-year olds prepare meals for themselves but are sorely disappointed if children of this age cannot readily learn beginning reading and the rudiments of set theory in arithmetic. Even if an adult were to require a young child to learn to cook, he would undoubtedly assist the child at every point in the process by providing constant prompts and guidance. Not so with reading and arithmetic: The amount of independent learning expected of children, at both preschool and elementary school levels, is truly astounding. Apparently, adults have a far better appreciation of the difficulties involved in meal preparation than of the learning of school subjects. The point is that if we continue to expect herculean intellectual achievements of young children, we must be prepared to provide assistance commensurate with our demands.

These implications not only apply to so-called normal children but also to handicapped children. For responsible adults to improve their effectiveness in assisting handicapped children to learn, they must relinquish two illusions: (a) that such children cannot learn readily--with proper assistance it is demonstrable that they can; and (b) that young "normal" children characteristically learn with great ease and independence. Recall, for example, the research showing that only 10% of a sample of 4-year-olds was able to learn the concept of "oddity" in fewer than 200 trials of practice. It is a grave mistake to assume that the academic learning we require of young children, normal and handicapped alike, can be accomplished effectively without painstaking instructional support. With such support--and we should not make the demands unless we can deliver the assistance required--children can accomplish most tasks in due time with competence and even joy.

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Some of the most exciting recent research in child development is that conducted by linguists. One of their more interesting debates is between the acquisitionists and behaviorists regarding language development. Smith clearly resides in the acquisition group which perceives the early research studies of Lipsitt, White, Kagan, and Bruner as supporting the notion of the child as a highly skilled information processor from birth on.

The regularity of the appearance of language patterns across cultures is interesting. The fact has been established recently that children babble at three months and that by six months, tape recordings of babblings by English, Chinese, and Russian infants will reveal distinctive patterns.

Numerous investigators have suggested that an effective environment is one that maintains a rich verbal climate. The role of the mediator of the environment--usually the mother--is to order physical, spatial, and temporal tasks for the child and to supply responses and warm emotional support. Smith emphasizes that, given such a supportive environment, the child alone acts upon and constructs the mechanisms by which he learns. Smith appears to agree with Piaget in perceiving the brain as the specialized organ that deals with external reality. The brain's function in the organism's survival is the construction of mechanisms (schemata or structures) which the child can use to make accurate predictions about the world.

Smith's research is as current as that of Bloom, Bruner, White, Hunt, and Schaefer, all of whom are studying the very young child at present. As Smith points out, they believe early learning is important--as long as it involves learning how to learn. Smith's writings have focused on the relation of language acquisition and learning how to read. From his first book with the eminent George Miller, Smith has served as an analyst and synthesizer of research in linguistics, memory, and language acquisition to draw meaningful implications for teachers. In these tasks he performs an unique and valuable function.

Some Limitations upon Spoken and Written Language Learning and Use

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Important psycholinguistic findings have been made in recent years concerning the impressive manner in which the majority of infants gain a mastery of their mother tongues. This mastery is accomplished in a very short period of time without the apparent benefit of any obviously organized or specialized instruction. McNeill (1966, 1970) observed that a child normally acquires all the major facts of his native language in the preschool years; and Lenneberg (1967) demonstrated that the rapid acquisition of language follows a predictable progression so that language development, in fact, can be considered a maturational process, provided that certain learning opportunities, of the kind outlined in this paper, are available.

Language Learning

It has been found to be highly productive to conceptualize the core of our language skills as a set of cognitive rules which can be used both to produce and comprehend the theorectically infinite number of possible utterances in any particular language. These internalized rules of language comprise a working grammar, and they are prime examples of what Polanyi (1966) called "tacit knowledge." Such implicit rules or knowledge are assumed when our behavior or perceptions appear to reflect an underlying structure, and this structure is not immediately accessible to our awareness and we cannot say precisely what it is. For example, most of us would have the utmost difficulty in explaining what we know exactly that enables us to distinguish cats from dogs, hit a moving tennis ball, or recognize and understand grammatical and meaningful sentences.

Because tacit knowledge is not something we can examine directly, it is evident that a child does not learn to speak and comprehend language by being told what the rules are. No one knows enough about language to be able to designate the rules. However, the dearth of explicit information is not a handicap for the language-learning child because he does not rely on being told what language is in order to learn it. (Similarly, a child does not learn to recognize dogs and cats by being given verbal specifications of their distinguishing characteristics, any more than he requires a mathematical formula relating direction, velocity, and gravity in order to catch a ball.)

The stages through which a child progresses from infantile babbling and one-word utterances to eventual mastery of adult language are described and detailed by Lenneberg (1967). Two general points should be emphasized, however.

1. At no time does a child produce language capriciously or at random. His language is purposeful and systematic. Baby talk has its

own rules which the child successively modifies into closer and closer approximations of adult language.

2. It is misleading to regard children's speech as a miniature or deformed version of adult language. Some of the earliest rules that a child uses have no parallel in adult language.

In short, current research supports the notion that a child does not develop language skills by blindly imitating adults, nor can the child's ability to develop the skills be accounted for in terms of any simplistic stimulus-response model. Rather, it would seem that a child develops language for himself, that is, he "re-invents" it (Fodor's expression, I believe). He appears to work always on the basis of rules and moving rapidly and systematically toward the language around him. The child's method can be conceptualized in the following terms: He makes an assumption about what a rule of adult language is (i.e., the meaning of an adult expression or the adult construction for a particular meaning); he tests this hypothesis by putting it to work (he interprets or produces an utterance using the hypothesized rule); and he changes the rule if it proves in any way to be inadequate (if the meaning he derives is inappropriate or if the sentence form he produces is misinterpreted or corrected).

To a large extent, this process of generating and testing hypotheses about language and modifying them on the basis of feedback may be considered the part of language ability (or of learning, generally) that is innate. Children are not taught the way to learn language; it is part of the birthright of every normal child. Because the child himself, quite unself-consciously, makes and tests predictions about the underlying tacit rules of adult language, he is able to discover what the rules are without our having to tell him. This ability to learn without direction, in fact, seems the only natural way to learn; it is apparent throughout every aspect of the child's early years (Smith, 1975).

The child's opportunities to generate and test his hypotheses about language constitute the cultural and social variables in his environment. The less chance the child has to exercise his inborn language-learning skills and to receive essential feedback, the less likely he is to attain a full and fluent mastery of language. Precisely the same handicaps confront exceptional children. Moreover, the actual nature of a child's experiences when he endeavors to generate and test hypotheses about language are major determinants of the extent to which he will make use of the opportunities available to him to learn and use language.

The latter point deserves amplification. In order to learn about language a child must use language. Unless he can actually test a rule by constructing an utterance and using it in some language situation, he is unable to discover whether his hypothesis is indeed a rule of adult language. It is essential, therefore, that he be involved in linguistic interactions with fluent native speakers so that he can make his hypotheses about his language environment and gain general information about his native tongue (Smith, 1971); the feedback relating to the child's particular generated hypotheses is specific information.

Motivational Aspects of Language Development

A frequent assertion is that a child learns language because he has a need to communicate, that he would have no way of making his wants known and satisfied if he did not develop language. I would assert that such a view is a patent oversimplification. Most infants are never so well looked after as when they are unable to talk; in fact, the more they develop language, the less attention they usually get. If anything, language is used by adults to control a child's be-

havior rather than to permit the child to control theirs. Besides, it is difficult to see how a child could appreciate the value of language as a means of communication until he acquires some practical understanding of language. The "need to communicate" view of language learning seems to put the cart before the horse.

A child's motivation to develop language appears to derive, rather, from a far more general urge to understand the world around him and make sense out of all his experiences (Smith, 1975). A child looks for an order underlying environmental events because, otherwise, they would remain unpredictable and confusing. These arguments apply equally to exceptional children although, of course, organic or functional disabilities may limit a child's access to information or ability to make experience coherent. The fortunate child hears a great deal of language around him--the general information--and it provides the stimulus for him to understand what language is, and control and use it, just as he will try to make sense and order out of all the street noises and cooking smells and visual experiences that come his way. The sounds of language, in other words, are just another problem which a child tackles in order to comprehend and master the world he is in. Very soon, of course, he learns to use language as a means to further his general understanding of the world, that is, to engage in that universal childish pastime--asking questions.

Very little has been done to examine the nature of the urge to learn, possibly the most basic drive of all and certainly one that a child displays with remarkable intensity from the moment he is born. The urge to learn has been variously characterized as epistemic behavior (Berlyne, 1960) or a drive for effectance and competence (White, 1959). It is probably futile to speculate on what provides the motivation for a child to learn except that it is a biological inheritance essential for survival which all living creatures share.

It is worthwhile, however, to ask what maintains children's motivation to learn and use language and what will stultify that motivation. To a child who is trying to learn language, the most inhibiting experience must be the failure to get information when it is asked for. When a child is, in fact, learning, he is reinforced; when his efforts meet with discouragement or failure, he is negatively reinforced.

The child who loses his motivation to learn language is one whose efforts to learn are fruitless, because either the specific information or feedback is not available or he must pay too high a price if his efforts do not meet adult standards of performance or convenience. Statements such as, "Don't bother me now," "Stop asking questions," "Don't speak if you haven't got something sensible to say," "Don't ask me why, just do it," from a parent or teacher, will do much to discourage the spirit of inquiry which every child possesses.

What is not normal or productive for a child is to wait passively for information to be given at the convenience of and as determined by an adult. Not only does every human infant (except the most extremely disabled) appear to be born with this compelling motivation to learn, but all children also seem genetically equipped with a mechanism for learning, that is, the process of generating, testing, and modifying hypotheses. But note that children's hypotheses can only be tested by the actual production of behavior which is based on underlying predictions in an environment where language is spoken and a speaker can provide feedback.

A child, for example, does not want to be told the past tense of "eat" in any formal sense. He can construct his own hypothesis from the rules for past tense construction which he has already acquired about other verbs (e.g., kiss-kissed; hand-handed). He will try out the utterance, "I've *eated* all my dinner," which, of course is wrong

by adult standards but which sets the scene for the child's learning. When he receives the informative response from his parent or teacher, "I'm so glad you've *eaten* all your dinner," he can modify his hypothesis about the status of "eat" as a regular verb.

The foregoing example demonstrates a most important generalization: No one can learn unless there is a chance that he will be wrong. The child who does not know the past tense form for "eat," and who is reluctant to propose and test a possibility, is obviously most unlikely to get the information that he needs. Nor will the child receive useful feedback about how to further his language learning if he says something only when he knows he is right. By definition, there is nothing to learn if it is already known. In short, the only time a child will learn something is when he behaves in such a way that he can find out whether he is right or wrong.

Whether a child is, in fact, right or wrong in his hypothesis makes little difference as far as the ultimate informational value of feedback is concerned, provided of course that there is no penalty for testing false hypotheses. But whether we intend to or not, adults have encouraged the notion, and built it strongly into our educational system, that it is better to be right than wrong. A child who responds only when he knows he is right is in precisely the same situation educationally as a child who does not respond at all--he will learn precious little. If we can only learn when there is a chance that we will be wrong, then learning is an inherently risky business, especially in our perfectionist society. Repeated experience of failure is often blamed for discouraging many children from learning, but it may be the penalty for failure, rather than its actual occurrence, that handicaps a child.

A child who decides that it is too risky to use the mechanism for learning based on the "test a guess and see if you're wrong" principle is a child who deprives himself of the greatest intellectual tool the human race is provided with. In environments where children are discouraged from making errors and the use of language is restricted, a child is indeed deprived.

Other aspects of language place just as much of a limitation upon how a child learns and uses language as the motivational factors. I refer to the fact that there are quite severe constraints on how much any individual can comprehend and remember language that is heard or read. Definite constraints are set by the limitations of the perceptual system and memory that affect our language learning. These limitations apply to both spoken and written language, but because they are easier to explain with respect to reading, I shall consider them primarily in that context.

Reading and Cognitive Overload

We often tend to think that reading (or listening) is something of a passive activity, that the author is the person who is supplying all the information or knowledge and the reader who looks at the words on the page in the right order and with sufficient application will have the message delivered to him.

Two sources of information are, in fact, critical to the reading process: (a) the author (and the printer) who provides what I have called the *visual information*, the ink marks on the page; and (b) the reader himself, who provides *nonvisual information*. Put in another way, reading involves the mixture or interaction of the information that the reader receives through his visual system and the information that he already has available in his head, behind the eyeballs.

Suppose, for example, that a book is written in a language which the reader does not understand; obviously there will be very little

reading. Knowledge of the language is crucial nonvisual information which the reader himself must supply. Similarly, very little reading will take place if the subject matter of the text is completely removed from the reader's experience--for example, an article on subatomic physics for most English readers, or a life-on-the-farm story for an urban child. Obviously, a good deal of prior knowledge is required if any piece of text is to be read; everything the author takes for granted must be supplied by the reader in the form of nonvisual information.

An important aspect of the distinction between visual and nonvisual information in reading is their reciprocal relation, because readers can trade off between the two. The more nonvisual information a reader can use, the less visual information he needs; the less nonvisual information a reader can supply, the more visual information he must get from the page. Some aspects of this reciprocal relation are immediately apparent. When the material on the page is familiar, we can read faster, smaller type, and by a dimmer light. We can recognize familiar names and words over a greater distance than unfamiliar ones. On the other hand, we tend to peer more closely and read slower when the going is hard, when our own contribution to the understanding of what we are reading is limited.

This use of nonvisual information to facilitate the work of the eyes is reflected in the way all readers make use of redundancy. (Redundancy means information to which you do not need to pay attention because you know it already.) If a passage is redundant because the plot is predictable, or because the sentences are simple and almost everything is said more than once, then less visual information is required, and reading is easier.

The fact that there is a trade-off between visual and nonvisual information in reading is absolutely critical because there is a limit to the rate at which even the normal brain can handle incoming visual information. This limitation is often overlooked because we tend to think that we see everything that happens before our eyes. We are not usually aware that the function of the eyes is simply to pick up and transmit information from the visual world to the brain, and that the brain has the job of making the perceptual decision about what we see.

There is a limit to how fast and how much visual information can be handled by the brain. For example, it is impossible from a single glance--what in reading is called a fixation--to make an identification of about more than four or five different things. More visual information may be available to the eyes, but four or five identifications is as much as the brain can manage from a single fixation. If a reader is allowed just one glance at a sequence of random letters, for example, he will be able to identify no more than four or five of them. This is one of the oldest findings in experimental psychology (Cattell, 1885). And it will take at least one second for the reader to identify those letters. It is not necessary, of course, for the reader to look at the letters for the entire second; in fact, a glimpse lasting no more than five-thousandths (.005) of a second is usually more than enough for the eye to transmit to the brain all of the visual information it is going to be capable of handling for a second (Sperling, 1960). The brain spends the rest of the time processing the information. For this reason, attempting to speed up the rates of fixation from the four or five identifications a second that a child, and any other reader, normally makes is a pointless endeavor since the information bottleneck is in the brain.

Of course, we can all read faster than the rate of four or five letters a second (which would work out to a reading rate of barely 60 words a minute if we actually read words letter by letter). In fact, if the sequence of letters our reader is allowed to glimpse is made up

into recognizable words rather than random combinations, then we find that from one single fixation he can identify a couple of words comprising, perhaps, a total of 10 letters. In other words, if the letters that are shown to him are organized into words, then he can identify twice as many letters in a single glance and in the same period of time.

The eye is doing the same amount of work on each of the two occasions, whether it is inspecting letters in a random sequence or in combinations that form words the reader knows. In the second instance, the reader can make use of nonvisual information, namely, his knowledge of the way in which letters are organized into words. It happens to be a fact that uncertainty about a letter (if the ink is light, type is broken, or the letter is at a distance) is reduced by half if that letter is part of a word. The less the uncertainty about a letter, the less visual information is needed to identify it (Shannon, 1951). If you can see that the first letter of a word is *t*, you know that the next is going to be *h*, *r*, *w*, or a vowel; however, if the letters are single units in a random order, then the following letter can be any one of 26 alternatives. In other words, because of what you already know--nonvisual information--you require less new information to decide what a letter is when the letter occurs in words and words are in meaningful sentences.

(Note that it is the prior knowledge of the reader, his nonvisual information, which is the ultimate determinant of whether a sequence of letters is random. Is the sequence *smakelijk* random? The answer depends on whether you can read Dutch: If you can, one glance at the word would suffice for you to recognize it; if not, you would be unlikely to be able to report half of it.)

We have not finished with the brain's economies in making one fixation's (or one second's) worth of visual information go as far as possible. If the words our reader is permitted to glimpse actually constitute a meaningful phrase, he will identify, on the average, four of them--a total of 20 or more letters. In other words, if the reader can supply nonvisual information of a syntactic and semantic nature (his knowledge of the language and the world in general), he will be able to use the same amount of visual information--one glance--to identify more than four times as much, 20 or more letters compared with 4 or 5. This phenomenon is called "span of apprehension" or "effective field of view."

It is helpful to look at the preceding phenomenon from the opposite point of view. If a fluent reader is allowed a single glance at a long sentence, if he is, in effect, allowed one second of visual information processing time, he will be able to identify four or five words. In essence he "sees" four or five words. (When we read faster than four or five words a second we are making even greater use of nonvisual information and not bothering to identify most of the words we read.) However, if the reader is not able to make extensive use of nonvisual information, either because he has limited subject matter, language, or reading knowledge, or, what to him amounts to the same thing, if the letters are organized randomly, then he will literally be unable to see more than five letters. The less nonvisual information you can supply, the less you are able to see. This phenomenon is widespread and known as "tunnel vision" (Mackworth, 1965). Jet pilots suffer from tunnel vision when they are involved in the complex task of trying to land their planes; they are so overloaded by visual information that their effective field of view is very narrow. Beginning readers are prime victims of tunnel vision; the width of line they can actually see is tremendously constricted by the limited amount of nonvisual information they can supply, especially if the material they are reading is relatively nonsensical (which means low in

redundancy or predictability) and the demands upon them for literal accuracy (emphasis on visual information) are high.

The fluent reader, on the other hand, is one who makes maximum use of nonvisual information; he uses all the available redundancy, guesses as much as possible, and relies to a minimum on visual information. Speed readers, who are so skilled that they can make their ration of visual information go as far as possible, are able to read entire pages in a couple of fixations.

A child learning to read is going to read slower and more hesitatingly than one with rather more experience, largely because he does not have very much nonvisual information at his disposal. Reading, for such a child, may be compared with trying to read in half-light for an adult. The beginning reader is reading as if he is looking at the page through the wrong end of a telescope. Even if he can recognize a word on sight, he still needs twice as much visual information as a fluent reader to identify it. It is probably twice as hard for a child to read a word that he knows when he is learning to read than when he reads fluently. Similarly, an experienced reader needs twice as much visual information to read a word in isolation than to read the same word in a sentence.

To fully appreciate the disruptive effect of the limitations of the visual system in reading, it is necessary to examine another aspect of cognitive function that exercises considerable limitations upon us all--memory (Atkinson & Shiffrin, 1970; Norman, 1969). That there is a severe limit to how much we can put into our working memory (also called "short-term memory") can be graphically illustrated. Unless we put some kind of pattern to a series of numbers or sequence of letters, we are limited to retaining only four or five items. (Ignore the equivalence between the 4-5 random letters which can be read in a single glance and the 4-5 items we can hold in short-term memory; the similarity is coincidental.)

In effect, this limitation in short-term memory restricts the number of things we can pay attention to at any one time. It is of the utmost importance, therefore, that we use working memory efficiently. If we try to overload short-term memory, if we attempt to overfill its five-item capacity, then for every additional item we try to put in, something will come out. There are only two fates for information that overflows from short-term memory: (a) to be put into our permanent memory store, a time-consuming business as I shall show, or (b) to be lost altogether.

You have probably noticed the rather vague and unscientific language used to describe the capacity of short-term memory and how much can be identified in a single glance ("4-5 *things*"). By now, you must realize that a "thing," or "item" as I have also called it, is a unit. The size of each unit is determined not so much by external considerations as by what the brain can do with it. In a single glance we can identify 4-5 random letters *or* a meaningful sequence of 4-5 words. Similarly, we can load up short-term memory with 4-5 letters *or* 4-5 words; or we can load it with 4-5 larger chunks of meaning. We know this "chunking" is possible because we can hold in short-term memory the meaning, but not the exact words, from utterances of a dozen words or more. You can probably repeat the gist of the last couple of sentences you have read although you have not had time to put it into permanent memory; but you could not repeat the exact words from which you extracted that underlying meaning.

Obviously, to be a fluent reader you must be able to use short-term memory efficiently; that is, you need short-term memory with items that carry as much meaning as possible. If you are reading with tunnel vision and can put into short-term memory only meaningless sequences of letters or fragmented words, you will be unable to read

with comprehension. In other words, unless you are able to make fluent use of nonvisual information, you are going to be defeated from the start by the limitations of short-term memory. Nonvisual information is what provides the meaningfulness for what you read.

The handicap of short-term memory becomes even more obvious when one considers the limitations of long-term memory. Long-term memory is the permanent memory where we organize and store all our knowledge of the world; its information is not transitory, like that in short-term memory. For the information to go into long-term memory, a permanent chemical change in the molecular structure of the brain appears to be necessary (Melton, 1963). Similarly, long-term memory appears to be practically infinite in capacity. Long-term memory suffers from none of the limitations of size and duration of short-term memory. However, as we all know, having something in long-term memory is no guarantee that we can get it out again. Sometimes only a psychoanalyst's careful and persistent verbal probing, or the stainless steel probe of the brain surgeon, can give us access to our earliest memories. Generally, the question of whether we can recover information from long-term memory depends on how well we have it organized and how efficient are the memory probes that we send down to find and retrieve it.

We are more concerned at the moment with the rate at which new information can be put into long-term memory. Long-term memory is very slow and limited indeed compared with the more volatile short-term memory. From three to five seconds is required to put one item of information into long-term memory, whether the one item of information is a letter, a word, or an entire chunk of meaning.

Some of the implications of the limitations of the visual system and of short-and-long-term memory are particularly critical for reading (they have been spelled out in some detail by Smith, 1971; Smith & Holmes, 1971). For example, it is probably impossible to read with comprehension at slower than 200 words a minute as the units we try to get into short-and-long-term memory would be too small and fragmented to be of any use. Similarly, it is impossible to read for meaning if we stop to read every individual word. Short-term memory will soon overflow with a meaningless clutter of disconnected words and bits of words if we read word by word. It would be most impractical to try to cram such information into long-term memory.

Fluent reading is the constant making of hypotheses about meaning and testing them with a minimum of visual information, rather than of analyzing every bit of visual information on the page and trying to strain it through the narrow sieves of memory. Most children know this fact (tacitly) when they begin to learn to read; that is why they will skip difficult words and guess, aiming to grasp the general meaning. In this sense, a child learning to read behaves very much like the fluent reader. The child learns early that his visual system and memory become so rapidly overloaded that it is impossible for him to read with comprehension in the overprecise way adults often expect.

The basic underlying motivation of a child is to look for sense in the world. Nothing is less likely to make him want to read than to be confronted with material that, to him at least, has no meaning. The page of text that makes adequate sense to an adult, as an experienced reader, may be a mess of visual nonsense to a child afflicted with tunnel vision. Telling a child, "Read slower," or "Read more carefully," may cause him to persist in tunnel vision. Even if a beginning reader is familiar with every letter and word on the page, the lack of ability (or permission) to read with a maximum of nonvisual information may make it impossible for him to escape the constriction of tunnel vision.

The practice of testing reading by asking numerous comprehension

questions is basically an imposition upon long-term memory. Pressure upon a reader to put more information through the slow and narrow entry into long-term memory may have a reverse effect. The short-and-long-term memories become jammed with trivial and incoherent pieces of information and, as a result, the reader understands and remembers less. For this reason, many books that a student of any age might read of his own volition out of school become unreadable within the educational context. It is not that the student has less motivation to read and remember, but that the book literally becomes harder to read. The more a reader expects to be asked questions on what he reads, the more he will rely on visual information and the more difficult reading will become. Most of us are aware of the additional physical effort that is required when we are confronted with a book on a topic with which we are unfamiliar, although a specialist in that subject might read the same book with speed and facility. To the specialist (in classroom contexts, usually the teacher), there is a good deal of redundancy in subject-area texts (because the specialist knows the subject already); and redundancy, as noted earlier, is the basis of fluent reading. The inability to make use of redundancy because of the lack or inaccessibility of nonvisual information, provides an insurmountable obstacle for a reader in unfamiliar territory.

One final point about reading: In any situation in which an individual is anxious or unsure of himself, or in which he has experienced an unhappy succession of failures, his behavior exhibits an inevitable consequence: He demands far more information before he makes a decision. His very hesitancy aggravates his difficulties. A similar dilemma confronts anyone trying to read in a condition of anxiety, regardless of the material or the underlying reading ability. The more anxious he is, the less likely he is to rely on nonvisual information. The ironic consequence is that such demanding behavior makes the probability of error and misunderstanding greater rather than less. Where the relaxed individual sees order, tenseness creates visual confusion. Anxiety produces tunnel vision.

Overloading Speech Comprehension

I have gone to some length to indicate how the limitations on the rate at which visual information can be handled and on the capacity of memory can make a functional illiterate out of any reader if the demands are too great. My general conclusions can be stated far more briefly:

Everything I have written about vision and reading applies similarly to listening and speech comprehension, except, of course, that we are concerned with acoustic and nonacoustic sources of information rather than visual and nonvisual. The source of nonvisual and nonacoustic information is basically the same as visual information: prior knowledge of language and the world.

The less nonacoustic information the listener can provide, the less he is familiar with the language being used or the topic under discussion, the more acoustic information he requires. A common manifestation of this phenomenon, frequently replicated in laboratory studies, is that familiar language is audible in noisy circumstances when other utterances cannot be distinguished (Cherry, 1971). In other words, it is not the sound level that determines whether speech will be comprehensible, any more than visual intensity determines whether written words will be readable, but the information that the listener or reader himself contributes, rather.

Furthermore, there is a limit to how much acoustic information the auditory system can handle. As a consequence, a listener who can supply insufficient nonacoustic information will have difficulty in

hearing what is said, even though there is nothing basically wrong with his intellect or hearing or language ability. In effect, a child who is limited in the extent to which he can apply nonacoustic information will not understand what is said.

The preceding paragraph, I am sure, strikes a familiar chord within many teachers. Adults are often surprised that a child who appears hard of hearing in the classroom suddenly seems quite normal at play. The transient deafness is not maliciousness on the part of the child, nor necessarily the wandering of attention. Wandering of attention is frequently a consequence of comprehension difficulty rather than a cause. Similarly, a child overly attentive to what is said for fear of being unable to answer subsequent questions is likely to overload short-term acoustic memory and reduce rather than improve his comprehension and recall.

As I said at the beginning, a child who is deprived of the opportunity to hear and comprehend speech is a child who is deprived of information essential for the fluent acquisition of language skills. Unrealistic demands upon his capacity to comprehend language can isolate him from language experience just as effectively as physical deprivation or deafness. Problems of information overload that can temporarily handicap a normal child may be particularly disabling for exceptional children.

Only through the use of spoken language--speaking and comprehending--can a child master speech, just as it is only through reading that he becomes a reader. There can be no substitute for experience when the art of learning to comprehend spoken and written language involves learning to attend minimally, rather than maximally, to incoming information. The easiest way to make language acquisition difficult for a child is to overlook the fact that there are limits to what any human brain can accomplish, no matter what the underlying competence.

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A great deal of research in child development has focused on child-rearing conditions which result in an interruption of the orderly process of growth. For example, numerous studies have focused on the adverse effects on children's development when they are raised under orphanage conditions. Currently, these studies are quoted to support the interventionist position that an adverse environment disrupts cognitive development. A closer examination of these works reveals the investigators' interests in the socio-emotional development of the child as well as in his cognitive losses.

Heinicke has a long history of work in this field; his book, Brief Separation, summarizes his position. He and his co-workers have been attempting to make operational the elusive concept called self, ego, or self-esteem, and "normal" interpersonal relations. Heinicke bridges both Anna Freud's psychoanalytic approach to and position on developmental lines and Robert Sears' social-learning position on the need to make operational such constructs as dependency. He uses the case study and small-group methods as approaches to a metaphorical grasp of the ego, which permit a greater understanding of the development of the affectual nature of the human organism.

In his most recent work, much of it reported in this chapter, Heinicke has centered on task orientation. To him, task orientation is the ability of the child to engage in, persist in, and take pride and pleasure in a task. By definition, the development of task orientation is crucial for the child's success in school and Heinicke traces the origin of this skill to the child's experiences in interacting with his family or care givers.

Early Childhood Social and Emotional Development: Relationships and Task Orientation

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Task orientation is one of the most important social-emotional variables in the effective teaching of the young child. This chapter focuses on the concept and on its relations to other variables. Task orientation is here defined in terms of the child's capacity to engage in, persist in, produce in, and take pride and pleasure in the task. A variety of behavioral categories are related to the following aspects of task orientation: engagement, disengagement, disruption, aggression, productivity, self-reliance, and pride and pleasure in the task (Heinicke, Strassmann, Hauer, Strathy, Ramsey-Klee, & Spingath, 1974; Heinicke, Strassmann, & Phillips, Note 3).

Task orientation must be conceptualized and measured in specific situations and in relation to particular groups of children. My associates and I have studied and filmed (Heinicke, 1971) the preschool child's task orientation under several different circumstances:

1. where the child defines his own structure (e.g., builds a "house"):
2. where a variety of materials are provided and a task sequence is suggested but which, nevertheless, leaves the child room for self-structuring (e.g., providing pieces of wood and glue or leaving a number of books on the table); and
3. where the structure, in the sense of either the goal and/or steps to reach that goal, is defined by the adult (e.g., listening to a story and answering specific questions about it).

Additionally, in this chapter, task orientation is further defined by showing its associations to other child behaviors (as seen in children aged 3-10 years); the potential impact of the parent-child relationship on task orientation and associated child behavior is discussed; and the intensive observations of two preschool girls are used to illustrate the specific impact of the nature of the parent-child relationship on initial adaptation to preschool and on subsequent IQ and task orientation.

The two general assumptions which are expanded in this context are that (a) the quality of the child's task orientation becomes a prime consideration in the approach and effectiveness of any effort to teach her/him, and (b) a prime variable associated with that task orientation is the nature of the child's past and present relationships with salient adults in the environment.

Task Orientation: Associations to other Child Behavior

The age interval of concern in this chapter is 3-10 years. There is now considerable evidence to support the hypothesis that observed variations in task orientation at about 3 years of age are predictive

of task orientation at later ages and associated with performance on intelligence tests at 3 years as well as with IQ scores later.

In the extensive Fels longitudinal study, Kagan and Moss (1962) measured the child's general task mastery as well as his more specific intellectual achievement. *Task mastery* was based on the child's persistence with challenging tasks, games and problems and involvement in activities in which a standard of excellence was applicable. A number of other achievement areas were also assessed, including intellectual achievement reflecting the child's attempt to master language and numerical skills, his motivation to perform well in the school situation, his involvement in knowledge acquisition, the amount of time spent reading, and interest in scientific projects. These as well as related ratings were available for the age intervals of birth-3, 3-6, 6-10, and 10-14 years. IQ scores were available for ages 3, 6, 10, and 13 years.

Intercorrelation of these measures revealed the following;

1. The general index of task mastery for the 3-6 year age interval correlates significantly with the same index for the 6-10 year age interval.

2. Unlike more specific achievement variables, the general index of task mastery at the 3-6 year age interval correlated in both sexes with the IQ scores obtained at ages 3, 6, 10, and 13 years and in adulthood.

3. The general task mastery during ages 3-6 years also predicted the intellectual achievement variable at ages 10-14 years, and this variable, in turn, was highly predictive of the IQ results of adolescence and adulthood.

A number of studies focusing on shorter time intervals confirmed the results of the Fels longitudinal report; they demonstrated a relation between components of task orientation as assessed in kindergarten and reading performance in grades one through five. De Hirsch, Jansky, and Langford (1966) included only the two personality variables of ego strength and work attitude in their kindergarten test battery and each proved predictive of later reading ability. Atwell, Orpet, and Meyers (1967) reported that kindergarten test behavior variables of ability to concentrate on the test task, effort displayed, interest and self-confidence shown in the task, and the manual dexterity demonstrated related to fifth-grade reading scores.

Our own pilot research (Heinicke, Liebowitz, & Aronson, Note 1) conducted on a sample of 10 middle-class families, showed that the children who were observed to be high on task orientation at 3 years 5 months were judged by the examiner to show greatest engagement when given the Wechsler Preschool Scale of Intelligence at age 5. That is, the same children who could engage in the story time when they were 3 years 5 months old, could also engage actively in an intelligence test situation at age 5.

Also of interest is the fact that the children who showed the *least* general engagement or concentration at age 5 performed less well on the performance as opposed to the verbal items of the Wechsler Preschool Scale. Initially, this finding was quite puzzling. It turned out that the children showed a striking deficit on the subtests "Picture Completion" and "Mazes." Significantly, both subtests can be interpreted as arousing unresolved conflicts in the area of separating psychologically from the mother. In the Maze subtest, the child is asked to trace the path whereby the baby chick returns to its mother, and in the Picture Completion the child must identify what is missing in a picture.

Children who had difficulty with these subtests also had difficulty remaining alone with the examiner, which further substantiates the hypothesis that the testing situation, and especially these two performance scale subtests, stimulate unresolved psychological con-

flicts around separation. Furthermore, the intensive longitudinal data describing these children's entrance into preschool revealed an inability to resolve the issue of moving from their home base into a new nursery school (Heinicke, Busch, Click, & Kramer, 1973). These data were confirmed by the finding that systematic ratings of the 3-year-old child's ability to move psychologically from home to school during the first five months correlated with the ratings of task orientation made at the end of that period, as well as with those done at 4 and 5 years. ALthough this sample was small, the longitudinal observations were frequent, covered a two-year span, and included various methodological safeguards in the design.

As part of the subsequent project in which the impact on "at risk" preschool children of psychoanalytic social work with their parents was studied, a series of child development and parent-child variables were developed and factor analyzed. Taking a point when the child was approximately 3 years 6 months old and when (s)he had been in the preschool day care center for five months, we found that the child's task orientation was part of a factor that also loaded on such ratings as ability to move psychologically into the preschool, ability to develop peer relationships, ability to modulate aggression, and, finally, a general index of adaption. Of the various factors generated, this cluster accounted for 51% of the variation in the total correlation matrix. I recognize, of course, that the nature of the factors generated will vary as a function of the nature of the child variables analyzed. Here, I wish simply to give one example of how task orientation relates to other developmental indices (Heinicke et al., 1974).

These findings have shown the stability of the task orientation or mastery variables from age 3 years on and the relation of the variables to measures of academic and intellectual achievement, as well as other indices of child development. This cluster of variables can, in turn, be further defined by placing it in the context of an even greater variety of personality assessments.

As part of an intensive study of the effects of treatment on children referred for serious learning disturbances in the third and fourth grades, 46 ratings were made before, at the end, and one and two years after treatment (Heinicke, 1969). (Note that here we are shifting to the upper part of the age bracket under discussion.) Application of a principal components factor analysis resulted in four factors, one of which, *level of ego integration*, accounted for approximately 60% of the variance. This factor, which could also have been called "level of ego strength," included the following ratings: ability to persist in a task; realistic concern about academic progress; extent of academic ambition; absence of denial of the academic problem; capacity to sublimate; effectiveness of defenses; capacity to tolerate anxiety; level of self-esteem as a function of achievement; ability to assert oneself; predominance of progressive over regressive forces; and certain others.

Interestingly, the factor scores derived from the ego integration cluster correlated with the Stanford-Binet immediately before and after treatment as well as one year after termination. The *increase* in IQ between beginning treatment and first follow-up correlated with the level of ego integration factor scores reached at first follow-up. Studies of normal populations have demonstrated a relation between measures of IQ and ratings of personality not unlike those included in the ego integration cluster (Bayley & Schaefer, 1964; Sontag, Baker, & Nelson, 1958).

These findings suggest that the behavior included in the concept of task orientation is not only highly relevant to the nature of the achievement in the IQ test situation but evident in the context of personality dimensions described by the concept of ego strength. There is disagreement on the critical variable in this cluster. Some persons

argue that it is the genetically endowed level of IQ or the general temperament that is the major source of variance. We are continuing to measure the task orientation of the child as directly as possible, but at present the correlation between task orientation and IQ suggests that the IQ-testing situation effectively taps this aspect of behavior. Variations in IQ test performances are, of course, only influenced, not accounted for, by variations in task orientation. Nor is reading or other academic achievement insured by an adequate level of task orientation.

In part, the cognitive-perceptual assets and deficits in a child which must be considered in a step-by-step curriculum to insure adequate growth are discussed in other chapters of this book. However, the fact that the pre-reading quality of the task orientation predicts the later primary grade reading level underlines, among other things, the expectation that if the educator fails to attend to the sequence of the child's readiness to engage in a task, his production once engaged, and his pride and pleasure in production, the educator's other well-planned efforts may be fruitless.

If the quality of the child's task orientation and associated variables at age 3 are predictive of IQ and academic achievement in the early school years, it becomes of particular interest to ascertain what factors are likely to influence this cluster of variables at that age or before. Again, there are many possibilities. In the following section, studies of the association between parent-child relationship variables and selected child development indices, including task orientation, are reviewed.

Task Orientation: Associations to the Quality of the Parent-Child Relationship

Two important well-known longitudinal studies present evidence relating parent-child relationship variables, particularly maternal ones, to later task orientation and mastery behavior. It is important to note that the data for these publications were gathered over a long period of time, beginning as early as the late 1920s.

Kagan and Moss (1962) concluded that the pattern most likely to lead to general task mastery in boys at ages 3-10 years is early maternal protection at ages birth-3, followed by encouragement and acceleration of mastery behaviors during the age interval 3-10 years. The associations between maternal behaviors and girls' achievement are not the same as for boys and more difficult to interpret. However, the girls' achievement during the 3-10 years interval is, as for the boys, associated with the mother's acceleration of that achievement during that time. Without going into detail, these maternal variables take on added significance in that intellectual mastery in adult males and females was also associated with these earliest maternal variables.

Analyzing the data of the Berkeley longitudinal study, Schaefer and Bayley (1963) reported the significant intercorrelation of the following clusters of child behavior: (a) happy. positive, and calm behavior at 1-3 years; (b) friendly, cooperative, and attentive behavior in the age interval 3-8 years; and (c) behavior at ages 9-12 showing interest, attention, exerting effort, not being distractible, being systematic, and the like. Those behaviors described for the age intervals 3-8 and 9-12 years seem particularly relevant to task orientation. Notably, all three of the clusters were correlated positively with a maternal love-hostility dimension, as assessed during the interval from birth-3 years.

As part of a review of subsequent longitudinal research dealing with both parent-child and child development variables, Heinicke and Strassman (Note 2) formulated certain hypotheses relevant to this

chapter. Further evidence is given that task orientation is part of a cluster of child development indices which are often labeled "competence" or "general adaptation." This evidence holds true for all three age intervals considered in the review: birth-1, 1-3, and 3-7 years. Without going into additional detail, it suffices to point out that the clusters all included measures of general adaptation, cognition, task orientation, and person involvement. Reflecting changes in age, language development becomes an additional variable correlated in the cluster at ages 1-3, and indices of self-reliance and modulation of aggression become more *salient* in the cluster from age 3-7 years.

The review also supports the concept that various consistent family interaction patterns or profiles can be distinguished within a population of families. Of these family profiles or clusters, certain ones correlate with the cluster defining optimal adaptation or competence in the child. Moreover, although all these generalizations must be made with caution and, it is hoped, will be much refined, the parent-child interaction cluster that tended to correlate with the child's maximal development at all the ages considered included the following qualities: responsiveness and efficiency of the parent in meeting the child's needs, the parent's ability to exercise control and/or set limits for the child, and the parent's ability to provide appropriate stimulation to enhance learning. Reflecting changes in age, the parent's ability to enhance the child's move to autonomy and new experiences as well as new relationships becomes more salient in the 3-7 year age interval.

Returning to our own research (Heinicke et al., 1974), factor analysis of various parent-child relationship ratings made when the preschool child was 3½ years old resulted in five different factors. Factor scores derived from three of these parent-child factors in turn correlated significantly with the factor scores derived from the child cluster that included the task orientation variable. The three parent-child factors are the parent's affectionate availability, the parent's ability to move the child to new relationship and learning experiences, and the parent's tendency to encourage the child's self-reliance.

From these various studies we have concluded tentatively that a certain profile of parent-child and particularly mother-child relationships is associated with the quality of the child's task orientation and/or instrumental competence. A sensitive and affectionate caretaker who communicates with the child, encourages properly paced stimulating experiences, and also controls the child seems important at both 1 and 3 years of age. In the older child, the parent's ability to enhance the child's move to autonomy, new experiences, and new relationships becomes a more salient variable.

As the child moves from the home base, he carries with him certain inner expectations of the type of care and response he expects from the adults and children in a novel setting; in fact, the type of care he has actually been given by his/her parents helps to determine whether he can make use of the new relationships. I would like to further illustrate this conclusion by describing the initial adaptation of two 3-year-old girls entering a day care center.

Task Orientation: Development in Two Girls Entering Day Care

The two girls in the study, Judy and Amy, were similar in certain respects but differed in their relationship opportunities and eventual task orientations. In both instances, a divorce had prevented much contact between the girls and their fathers; the mothers had been working full time for at least a year and both had asked their own mothers to care for the children. The financial resources of the two

families were limited.

Judy's mother was clearly in tune with the child's needs, especially in the area of early feeding. Judy's good developmental progress reassured the mother about her handling and judgment, especially when she was criticized by her husband and mother. Not surprisingly, Judy had adopted an attitude of waiting in expectation that she would be satisfied; trust and patience, combined with a winning smile, typically brought about the result she expected.

The mother-child closeness between Judy and her mother was reflected in the quality of their entrance into the day care center from the very first day. They came into the room together, holding hands; and they were greeted with warmth by the teacher who showed Judy her locker. During this interaction, Judy seemed interested, all the while holding on to her mother's hand. After this period of holding hands, Judy allowed herself to be taken to the corner of the room where the teacher explained various toys to her. About a minute later, she looked around to see her mother and went back to her. Yet, after a moment on her mother's lap, the teacher was able to interest her in some Playdoh, although Judy now asked her mother to come with her. She entered into the activity as the mother sat next to her and made cookies for her. It was a warm exchange. They had been sitting there for about 15 minutes when the grandmother arrived; the mother left momentarily to bring the grandmother into the room. Judy reacted to the mother's departure by becoming serious to the point of sadness, but moments later she was seen laughing with a grandmotherly looking teacher's aide. When this aide turned to another child, Judy tried to regain her attention; when the attempt failed, she again looked sad and resigned.

At this point, mother returned and sat with her. Judy hugged her and would not let her go. She made little Playdoh boy dolls and handed them to her mother. Just then the mother recognized a friend of her son's in the hall and went out again. Judy was left behind and, subsequently, resigned.

When the mother returned, the teacher told her she should not leave without telling Judy and her. Nevertheless, the mother again tried to leave but Judy's clinging made it impossible. The mother found all this behavior difficult and looked depressed. Judy soon became deeply involved in painting and the mother went to drink some coffee in the nearby parents' lounge. Judy screamed intensely and insisted again on sitting on her mother's lap. After juice, it was time to go outside and the mother encouraged Judy to go by herself. Judy complained, "Don't leave me. I'm going to be lonely." The mother answered, "You're not going to be lonely, I'm here. Your teacher is outside." Judy responded and, after some hesitation, went by herself. When the mother again left the room, Judy did not scream but rode by on her bicycle and asked where her mother had gone. Judy was soon involved in allowing teachers to pull her around in a wagon and, though looking somewhat sad, remained fairly active and did not cry.

In view of these reactions, the mother was able to leave Judy in the school and return to her work after the first day. Most important, however, is the fact that Judy initially stayed only for half a day and that the grandmother came to pick her up at noon. The impression of all observers was that her feelings were certainly dampened but she conveyed an expectation that she would be cared for in this situation. Judy exhibited a facial expression when her grandmother came to see her at noontime, which conveyed her grandmother's importance to her. When other children asked, "When is my mommy coming?" Judy asked, "When is my grandma coming?"

Although for purposes of this presentation it is necessary to simplify the developmental process that occurred, I would stress Judy's generally good development, her specific expectation that she would be

cared for by both her mother and grandmother, and the fact that although her mother remained in the nursery only one day she was clearly and positively available to her child. Without the presence of the grandmother, however, this relatively successful entrance into day care would not have been possible. The grandmother was available to the child and encouraged her to move toward relationships with the teachers. Judy's general trust allowed her to move toward both the head teacher and a grandmotherly teacher's aide which, in turn, opened up not only the Playdoh play but many other tasks that form a part of the nursery school environment. Though she reacted to having to share the teacher's aide, she could tolerate the situation. Nor is it surprising, in view of these early developments, that it made very little difference when she was transferred to an all-day care program.

The above observations also anticipate, however, the frequency with which Judy later showed signs of resignation and sadness. She was sad when her working mother was not available. The contrast between her heavy, sullen face when she was intensely involved in a task and her cheerful smile when she was greeted by her grandmother or favorite teacher was indeed striking. An expression of resignation was most apparent when again and again her mother's attention was preoccupied by a demanding older brother.

The commitment that Judy experienced seemed related to her readiness to comply with adult expectations and to become engaged. Just as she learned to expect gratification from adults, so she anticipated pleasure from the tasks and readily became involved. Five months after she entered preschool she persisted in a wood-gluing activity until she had made a complicated structure. She was proud of it and wanted her name on it. Similarly, she readily stayed seated during book-time, but sometimes her attention wandered and she looked sad, picked her cuticles, and had difficulty answering questions quickly enough. Since, just before the book-time, she had openly shown her longing for her father, it is likely that she was preoccupied with various fantasies about him while the book was being read.

Judy's score of 129 on the Stanford-Binet at age 5 indicated she was learning a great deal. The test examiner, who had no other interaction with her than the testing, concluded that,

> Judy performed in a quietly competent fashion, showing a good ability to grasp situations quickly and to judge and modify her replies when appropriate. Every so often she would wait for me to ask her to elaborate and this was particularly true on those tasks requiring a verbal reply. Some indications of anxiety appeared at this time but neither these indications of disruption nor the hesitancy to perform appeared on the motor tasks.

These findings in the test situation at age 5 seemed to parallel those observed in the task situations at age 3 years 5 months. Judy was generally engaged and functioned competently, but she showed some hesitancy when asked to reply verbally.

In contrast to Judy, Amy was from birth an unwanted child. Despite conscientious efforts, her mother found it difficult to give to her daughter. She had provided good physical care and protection but more often than not she had been aroused to anger by the inconvenience of having to care for her daughter and, particularly, by the very excessive demands that were placed upon her in her single-parent role. Amy was forced into a premature attention to cleanliness as a function of the mother's excessive needs in this regard, as well as a general independence; both related to the mother's attempt to establish some order in her life. These expectations were fairly well enforced by the mother. Her regime contrasted sharply with the laxity that Amy

experienced during the day with her grandparents. Although the grandmother needed Amy's companionship because she was depressed, her attention to Amy's needs was inadequate. This total environmental picture added up to not only inconsistency in the behavior expected of Amy, but the experience of helplessness by Amy about just what she had to do to gain the love she was seeking. Amy could communicate with her mother in rather adult conversational ways, but even this interaction was likely to be ended by the mother's suddenly not talking to her because Amy had spilled something on the coffee table.

Given both the confusion over what was expected of her and her intelligent striving to find a place for herself, it is not surprising that Amy entered nursery school in an active, extremely questioning way, asking, "Where is this, where is that?" One was immediately impressed by the lack of physical contact between mother and child and Amy's constant calling, "Mommy, I'm painting. Mommy, look at this." If the lack of affection in this mother-child relationship was reflected in these first moments of entrance into nursery school, so was Amy's desperate call for limits. She made her first commitment to painting at the easel and did so with great concentration. Soon, however, she was wildly dripping the paint from the paper onto the newspaper. "It's dripping, Mommy," she cried out loudly. Though very busy, the head teacher had to respond to this cry with some form of limits. Next, Amy attempted to make a series of personal contacts. First of all, she wanted her mother to come over and sit with her, but the mother turned her over to the head teacher. The teacher started to sit down with her but was interrupted as new children came in. Then an affectionate student aide, Susan, began to help Amy with the picture and labeled it for her. Amy produced three pictures of which she was very proud and, eventually, took home. When the teacher's aide turned to another child, Amy attempted a relationship with a little boy named Johnny. Whereas, prior to this time, Amy had often wrinkled up her face in anxiety, Johnny seemed to allow her to relax. Suddenly, however, he missed his mother and asked her to come and sit with him, thereby prompting Amy to call to her mother saying, "I'm not finished painting yet." Amy's statement was partly an invitation to her mother to come over, but the mother remained seated; thereupon, Amy began to attack Johnny and took his paints away. Johnny was passive and, therefore, the incident did not lead to any kind of scene. The mother accurately predicted the later fights that Amy would get into by saying that she thought her daugher would have trouble sharing with the other children.

Important to stress in terms of the present discussion is the fact that the combination of deficits in the mother-child relationship and Amy's way of coping with them seriously interfered with her developing new relationships with the head teacher and teacher's aide. Amy's experiences with her mother and grandparents led her to the urgent question, "Who will take care of me, who will stop me?" Though desperately trying to call attention to herself through her painting, it soon turned into a provocative call for limits and later, in relation to Johnny, an angry, jealous expression that she did not have as much as he since *his* mother came over to sit with him when he needed her. Also illustrated in the observations, and again confirmed later, was the fact that the staff was simply not in a position to give Amy the kind of affection and limits she was asking for and needed. If a teacher or teacher's aide had been made available at this point, it might well have made a significant difference in Amy's development, including her task orientation.

The difference between the two girls' situations is further emphasized by the fact that neither Amy's grandmother nor any other person with whom Amy had an established good relationship was available

to pick her up and take her home. I say "good relationship" because the mere continuity of someone who has taken care of a child is probably not sufficient. What should be stressed, therefore, is the fact that the total constellation of factors made Judy's experience a very different one from Amy's. The nature of the ongoing, affectionate and limit-seeking relationship, the child's typical mode of coping with stress and feelings of deprivation, the impact of both factors on the child's capacity to make use of available substitutes, and, finally, the availability of caretakers other than the mother with whom the child had had previously good relationships--all influenced the differential reaction of entry into day care.

When, under these conditions, Amy's mother returned to work after three days at the nursery, the transition into all-day care was difficult for Amy. The daily separation was particularly distressing as it seemingly represented an intense challenge to her feeling lovable, and her harsh crying indicated that she experienced the situation as abandonment. Again and again she would cry, "My mommy coming to get me?" and then break down. One felt that just as she could not retain a loving conception of her mother, so she could not retain a loving feeling toward herself.

As with Judy, five months after the initial entrance into the day care program, Amy's task orientation was systematically filmed and assessed. Amy did not persist with wood-gluing, showed no pride in the little she did produce, and soon was concerned primarily with establishing what cars and later what pieces of wood were hers: "It's mine, it's really mine, I had it first," she would call out, desperately trying to salvage some sense of satisfaction via such possessions.

When the teacher called the children for story time, Amy initially continued to drink more juice; this delay in joining in was followed by her lying down on the fringe of the group. She then began throwing Playdoh and made it necessary for one of the student teachers to hold her in her lap in order to prevent further disruptions. However, even with this support, Amy could not concentrate on the book and interrupted the story teller to ask where her favorite teacher had gone.

Commenting on Amy's IQ of 90 at age 5, the examiner felt that the score did not reflect her potential. He added,

> Amy shows little capacity for perseverance or self-motivated behavior and she came to the testing room only after the teacher promised to come and stay with her. Constant refueling provided by candy and the teacher's lap was needed to get Amy to respond at all. By taking the test materials and misusing them, she also quickly forced me to restrict her. It seems that, lacking inner controls, she forces others to set limits for her. Amy seems not to have learned to turn others on to her in a positive way but rather has a capacity to turn others away from her by demanding and manipulative behavior.

I might add, by way of clarification and emphasis, the fact that such "negative eliciting behavior" on Amy's part reflected her feeling of being a "bad" girl who did not deserve positive attention and, thus, unconsciously, she would behave in a manner that would lead to the rejection and punishment she believed she deserved.

Implications

If the emphasis on task orientation as a critical variable in the learning of young children with special needs is supported by further research, and if the parent-child relationship factors are indeed associated with such task orientation and correlated child development

variables, then it follows that changing the parent-child influences will also enhance the learning of the young child. Both a recent review by Bronfenbrenner (1974) and our own intervention research (Heinicke, 1976) support this hypothesis. With respect to the latter, the poverty-stricken parents of 3-year-old children experiencing psychoanalytic social work changed in a positive direction, both as persons and in their parent-child functioning. Their children scored higher on the Stanford Binet IQ and such child development ratings as the nature of the psychological move into the preschool, peer relationships, task orientation, aggression modulation, and general adaptation (Heinicke, 1976).

It is recognized that the child, of course, can be influenced in many ways and, in turn, can influence the parents and their interactions. Moreover, as shown in our discussion (Heinicke, 1976), it is important to consider many aspects of the child's development--not just task orientation--in order to understand his learning. Nevertheless, my associates and I have continued to experience that the quality of the child's task orientation is a prime consideration in the nature of the approach and effectiveness of any effort to teach him, and that the optimal manner in which to enhance this aspect of functioning is through the development of positive adult-caretaking relationships with the child.

As has been well demonstrated by Piaget and others, the natural tendency of the child is to seek to attain mastery of various skills and coping behavior. Thus, when the natural process has been interfered with because of a breakdown in the optimal parent-child relationship, it is often most expedient to focus remedial efforts in the realm of improving this relationship and, at the same time, ensuring that the other caretakers (teachers) provide the kind of relationship that will supplement and possibly (to a certain extent) make up for what the child is not getting in the home. Long-range coping, task orientation, and academic accomplishments, in the final analysis, most likely will be enhanced through the development of positive relationships that subsume various teaching techniques rather than a process that focuses primarily or exclusively on the latter.

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To introduce the second part of the book, Spicker discusses in detail the extent to which early childhood intervention programs have been successful in preventing or ameliorating mental retardation and learning disabilities. He emphasizes the identification of program elements which successful programs appear to have in common.

As Spicker points out, the development of programs for preschool handicapped children has done much to stimulate a revival of interest in early childhood education for all children. His work with McCandless and Hodges was recognized as one of the outstanding intervention programs of the 1960s. Since then, Spicker has analyzed his own and the programs of others to identify those skills that enable a child to succeed in school. His current research involves the teaching of those skills to young children through the use of puppets.

Prevention and Remediation of Learning Disorders through Early Childhood Compensatory Education

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Programs for young children under the age of 5 in the past have been provided largely for the middle class. During the Second World War, day care centers were operated for working mothers of all social classes. These centers, however, were custodial rather than developmental in nature. Preschool programs for handicapped children, prior to 1960, were operated largely by independent agencies or parent organizations, such as the United Cerebral Palsy Association and the National Association for Retarded Citizens. These programs were designed to provide relief for parents but, in addition, they were a first effort at providing educational services that might be of direct benefit to the children.

It was not until the establishment of Project Head Start in 1965 that this country conducted its first massive early childhood education program the main purpose of which was to provide services that would be of direct benefit to preschool children. The beneficiaries of the program were to be economically deprived 3-, 4-, and 5-year-olds. In 1972, the Economic Opportunity Act recognized that Head Start programs did not always include handicapped children. Therefore, the law was amended to insure that at least 10 percent of the enrollment opportunities provided by Head Start would be for handicapped children. A handicapped child is often defined broadly as one who deviates significantly from the average child in intellectual, social-emotional, communication, sensory, or motoric behaviors. Although Head Start is providing impoverished children with needed medical and dental care, as well as nutritional benefits, many professional educators view the program's major function as the development of those cognitive, motoric, and socialization skills that are necessary for later school success.

The major purpose of this paper is to provide an overview of the extent to which early childhood compensatory education has been successful in preventing or ameliorating mental retardation, behavioral disorders, and learning disabilities. The effective attributes of these programs should enable educators to modify existing programs or establish new ones to have the greatest likelihood of benefiting educationally deprived (lower-class, minority) children in general and handicapped children in particular.

Factors Influencing Intellectual Development

The Curriculum

When the doors of Head Start classes opened in 1965, only a few special curricula had been specifically designed to increase the cognitive, motoric, and socialization skills of economically deprived preschool children. Most programs were based on what has become known as

the traditional model. In this model the teaching of socialization skills is emphasized while the direct teaching of cognitive, language, and motoric skills is either ignored entirely or subsumed under the rubric "incidental learning."

Since 1965, several curriculum approaches have been developed or adapted for use with educationally deprived children. (Because Weikart's chapter deals directly with these issues, only a quick overview of the various approaches is presented here.) One of the major emphases in curriculum development in recent years has been on cognitive development. Included in this category are the programs developed by such persons as Gray & Klaus (Note 4), Hodges, McCandless & Spicker (1971), Karnes (Note 6), and Weikart (Note 9). These programs attempted to improve aptitudes for and attitudes toward school by stressing oral language development, discrimination learning, problem-solving ability, concept formation, and verbal comprehension. A somewhat different approach to curriculum development was the academically oriented track described by Bereiter and Engelmann (1966). The approach provides 4- and 5-year-old children with systematic, direct instruction in oral language, reading, and arithmetic prior to first-grade school entrance. Still another approach was the reintroduction of the Montessori (1964) program with its structured didactic materials and apparent emphasis on visual discrimination and visual motor integration.

In recent years the comparative effectiveness of these three approaches and the traditional one have been studied by Weikart (Note 9), Karnes (Note 6), and Miller (Note 7). To the surprise of the investigators, the traditional approach was found to be as effective as some of the experimental approaches in increasing cognitive abilities, as measured by intelligence test scores, when the programs had certain features in common. The programs that produced the most significant improvement in IQ scores were those with a strong language development component in the curricula. Thus, the Montessori program with its weak language development program consistently produced the smallest gains in IQ scores. Large IQ increases also resulted in those programs that were goal-directed toward improving children's problem-solving abilities, elaborative language, memory, and fine and gross motor abilities, in addition to socialization, independence, and self-help skills.

A final element that seems to be common to programs that are successful in increasing IQ scores relates to certain teacher characteristics: If a teacher firmly believes that the children she teaches have higher capabilities than they are presently exhibiting, she will do all she can to bring the children to that higher level of functioning. Stedman, Anastasiow, Dokecki, Gordon, and Parker (Note 8), summarizing the effectiveness of preventative programs, concluded that a "strong," stable, dedicated staff was a major element in achieving IQ gains with children.

The Home

Studies by Gordon (Note 3), Shearer and Shearer (1972), and Karnes (Note 6) seem to indicate that home-based programs can be as effective as school-based programs in increasing IQ scores. Although a combined home and school intervention program does not seem to be any more effective in producing IQ changes than either program alone, Gordon's data indicate that parents who support the school program have children who maintain their initial IQ gains. Furthermore, Anastasiow & Hanes (Note 1) found that the children of parents with positive attitudes toward school were achieving at significantly higher levels than children of parents with negative attitudes toward school. It seems evident that the maintenance of IQ increases and subsequent academic school success are tied closely to the achievement motivation the child

receives from his parents.

Probably the most exciting aspect of parent involvement is the kind of program diffusion effect that appears to occur. Gray and Klaus (Note 4) found that by going into the home and working with a particular target child, the younger sibling, who was merely observing the teaching, benefited as much from the program as his older brother or sister who was receiving the direct instruction. This phenomenon is termed "vertical diffusion." Similarly, there were horizontal diffusion effects from home intervention programs conducted in dense urban housing areas. Horizontal diffusion occurs when parents of experimental children interact with their neighbors who, in turn, begin to use similar materials and teaching strategies with their own children.

In summary, although home-based and school-based intervention programs are equally effective in increasing the intellectual functioning of economically deprived children, a home-based program may produce more lasting gains if it is successful in breaking down the negative attitude that many of the parents have toward schools. Such parent attitudinal changes are likely to provide the child with the achievement motivation he needs to succeed through school.

Age at Intervention

Research findings, such as those of Heber, Garber, Harrington, and Hoffman (Note 5), indicate that children from various social classes do not differ on intelligence test scores until they reach 1½ years of age. Once language becomes a major criterion by which intelligence is measured, children whose cultures differ widely from that of the mainstream middle class begin to show significant decreases in IQ scores. The Milwaukee Project (Heber, et al., Note 5) best demonstrated this phenomenon. The project involved intensive early childhood stimulation with infants whose mothers were identified as having IQs of 80 or below. At the time of birth, the infant was placed in either an experimental or control group of 20 children. It was hypothesized that without an early childhood intervention, the children's intelligence test scores would eventually decline to the levels of their mothers'. Upon initial testing on infant developmental scales, the experimental and control groups obtained similar mean IQ scores of 115. By 3 years of age, the mean IQ of the control children had decreased to 90 while that of the experimental children, who had been receiving an intensively enriched nursery school experience, had been maintained around 120. These differences were still holding at the end of five years on such tests as the Stanford Binet and WPPSI.

One might ask whether it is economically feasible to provide this type of intervention program in the future. Perhaps if mildly retarded girls were taught proper child development principles while they were still in school it would be unnecessary to provide their offspring with the intensive infant intervention program that Heber and his associates developed. An answer to that question must await the results of a study presently being conducted by Anastasiow, Grimmett, Eggleston, and Brown (1974). Inner-city disadvantaged junior high school boys and girls are being taught child development practices through a combination of course work and practicum experiences, and it is hypothesized that when they become parents they will be able to provide the necessary stimulation for their children to develop normally.

Another possible way of avoiding the high cost of an individualized infant stimulation program is to ask whether a group intervention program begun after CA 3 (the usual age for admission to Head Start) can be as effective in preventing intellectual, behavioral, and learning disorders as an individualized program begun in infancy. Reviewing the experimental compensatory education studies conducted by Wei-

kart (Note 9), Karnes (Note 6), and Hodges et al. (1971) with 3-, 4-, and 5-year-old children, respectively, Spicker (1971) concluded that the programs produced average intellectual increases of 15-25 IQ points, regardless of the age at which the intervention began. As noted earlier, the magnitude of the gains depended on the strength of the program's language development component and orientation toward cognitive developmental goals, and the positive expectations of the teachers for the children. Although it appears that intervention programs with severely deprived children begun as late as 5 years of age can still produce rather dramatic IQ increases, it remains to be seen whether such improvements will be as lasting as those begun in infancy.

School Achievement

Although, as has been indicated, many programs are able to produce dramatic increases in intelligence test scores, such changes in IQ do not necessarily result in better school achievement. In fact, we seem to be changing the child's label from "retarded" or "slow learning" during the preschool years to that of "normal underachiever" or "learning disabled" during the school years. In general, it must be concluded that no current experimental study has shown lasting school achievement advantages for its preschool graduates.

Welkart, for example reported statistically significant differences on the California Achievement Test by the end of the second grade between his experimental children, who scored at the 18th percentile, and his control children. who scored at the 3rd percentile (Note 9). The question is whether such a statistically significant difference is of functional importance. Since both the 18th and 3rd percentiles are in the lowest quartile of achievement, is it really necessary to differentiate between failure and extreme failure?

The effects of the Bereiter and Engelmann (1966) program on later academic achievement is worth noting. Children were taught reading and arithmetic before they entered first grade. Surely, one would expect the academic achievement of these children to be better than that of children who had not learned to read before first grade. Yet, when one looks at the achievement test scores of the Bereiter-Engelmann trained children, one finds that they had an advantage over other first-grade children only on such rote academics as arithmetic computation and reading word-attack skills; they were no different from other youngsters in arithmetic reasoning or reading comprehension. It thus appears that the Bereiter-Engelmann program only taught rote reading and arithmetic skills. Interestingly, by the end of second grade, even these rote skill advantages no longer could be found when achievement comparisons were made against children who had not had the Bereiter-Engelmann program (Karnes, Note 6).

Neither Head Start nor experimental preschool programs have been able to make up for years of poor nutrition, inadequate housing and medical care, and minimal intellectual motivation toward school goals. Thus, Follow Through programs were developed to give the children a longer time to "catch up" to the norm. Some early data indicate that Follow Through is somewhat effective, particularly with very low SES children (Emrick, Sorensen & Stearns, Note 2). These issues are discussed more fully in the following chapters.

In the meantime, reality dictates that if one wishes preschool programs to provide children with later academic success, one must prepare the children for school as it is. In many instances, reality means preparing children to succeed in school systems that reward middle-class social values and teach academic subjects by use of middle-class oriented textbooks, and such rote drill procedures as flashcards, workbooks, commercial ditto masters, and the like. The obvious solu-

tion is to modify our present schools by adding a multicultural curriculum, changing teacher attitudes toward poor children, and accepting the responsibility for properly educating all children rather than blaming the victims (Mosley & Spicker, 1975). Until such changes are implemented, the social success of economically deprived children from culturally different backgrounds will depend heavily on their willingness to learn to "play the game" of appearing to accept the social and cognitive demands that are made on them by most middle-class teachers.

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Weikart's activities, both in the public schools and through the High Scope Foundation, cover a broad spectrum. He works with gifted teenagers in a summer program, preschool children who reside in poverty, and handicapped infants and preschoolers. His research comparing three models of interventions is one of the few planned variation longitudinal studies and is reported in this chapter. His conclusions avoid an either-or conclusion and search for basic generalizations to guide future program developers.

Weikart reviews the literature from early education programs for functionally mildly retarded children. The chapter should be read for its rich implications for research dealing with the support of those persons who carry on day-to-day interactions with such children. It also can be read with an eye toward conceptualizing the possible benefits as well as deleterious effects of different kinds of programing for young children.

The data that Weikart and other investigators and programers in the field of early education are gathering re-emphasize the need for continuous intellectual stimulation and psychological support for people who work with children. As Weikart points out, curriculum is something within the teacher, not something outside of her/him. Curriculum is a structural organization within the teacher that helps her to focus on children and guides her interactions with them.

Preschool Intervention for the Disadvantaged Child:

A Challenge for Special Education

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Ypsilanti, Michigan

Mental subnormality as a diagnostic category is alive and well within the walls of academic institutions and special education classes, but in these places only, it seems, these days. Spokesmen for the civil rights movement and various minority groups oppose special education for the "educable mentally retarded." One civil rights lawyer was quoted in *Newsweek* (Sept, 20, 1971) as equating with cultural genocide the practice of labeling an inordinate number of black children "retarded" and assigning them to special classes. As is well known, there is a high correlation between the diagnosis of mental subnormality and socio-economic background; children from lower-class backgrounds, and especially black children, occupy a disproportionate number of seats in special education classes. This situation has led to what is perhaps an inevitable conflict between practices in special education and the recognized need for general improvement of the economic, social, and educational opportunities of minority groups.

The clash occurs especially in the area of diagnostic testing with its emphasis on the use of standardized intelligence tests to screen for mental retardation. Scores obtained for minority group children are held suspect because the designs of many tests favor white, English-speaking children from middle-class homes; as a result, black, Spanish-speaking, and other minority group students consistently score significantly lower than the norms on these tests, below the point demarcating mental retardation.

The outcry against the placement in special education settings of minority group children classified as mentally retarded has had great impact upon the education programs of many cities and states. For example, in Michigan, state rules and regulations specify that to be admitted to a special education class a youngster must obtain a score not above the 70 IQ-level on any intelligence test or subscale. Because very few youngsters from any group drop below 70 on standardized and individually administered tests, the impact of the requirement upon special education classes was immediate and obvious. One school system switched from the Stanford-Binet IQ test to the Leiter International Performance Scale, a culture-free instrument, the better to balance its special class populations. However, because on the Leiter Scale lower-class preschool children tend to score about 10-15 points below their Stanford-Binet scores, they still qualify for special education placement in disproportionate numbers.

The problem faced by minority groups is that the educational system administers diagnostic tests that generally find their children lacking. This finding suggests deprivation and calls into question

the minority group's history and accomplishments and, especially, its general pattern of child rearing and socialization. More and more persons are finding that assigning an inferior status to a disproportionate share of minority group members is inadequate and probably damaging to both the youngsters and their families.

Hess, Bloch, Costello, Knowles, and Largay (1971) have outlined four basic models that are used to account for the discrepancies in educational and intellectual attainment by minority and dominant culture groups (see also Gordon, 1969, and Hess, 1969). They are the deficit model, school-as-failure model, cultural differences model, and social structure model; all four are discussed in the following section.

Basic Educational Models

The Deficit Model

Persons who subscribe to the deficit model tend to see the "disadvantaged" child as coming from an environment that limits the development of adequate mental abilities. The family life is usually described as inadequate for the task of socializing the child, and special mention is often made of language deficits resulting from delayed speech acquisition and the use of dialects instead of standard English.

The deficit model was the basis for the thinking that created the War on Poverty and the earlier attempts at compensatory education. It also provides the impetus for special education programs designed for children classed as mentally subnormal. The early preschool experiments also were predicated on a deficit model. An article by Silverman and Weikart (1972) summarized the position of the Ypsilanti Preschool Project in its initial phase accordingly.

> Early intervention in the "learning process" of these children was seen as a means of helping them develop, during a critical period of their intellectual growth, those concepts and skills necessary for success in the public schools; in a sense, we were "reforming" the disadvantaged child, who, without such intervention, was likely to meet with failure in the institutions responsible for his education. (p. 59)

The Ypsilanti Project was not the only preschool based on these ideas. Deutsch (1962) and Gray and Klaus (1965) made similar assumptions. Indeed, the purpose of Head Start was to provide general health, social, and educational advantages to "disadvantaged" preschool children so they could have a head start on middle-class children; otherwise, their learning deficits would result in their falling irrevocably behind in the primary grades.

Jensen's (1969) position on genetically determined differences in intelligence between the races has been strongly supported by people like Shockley (1971) and strongly attacked by many others. Today, however, creeping into the literature are suggestions of black-white differences which have been found in a variety of sophisticated studies. For example, Lesser, Fifer, and Clark (1965) took considerable pains to eliminate cultural bias in their study of intellectual skills by ethnic group and social class,and they concluded that, in children aged 6-7 years,

> social-class and ethnic-group membership (and their interaction) have strong effects upon the level of each of the four mental abilities (verbal ability, reasoning, numerical facility, and space conceptulization). (p. 83)

In a subsequent study with a more sophisticated design, Farnham-Diggory (1970) was able to make a more precise statement:

> Differences between the Negro and white children were not found on verbal synthesis tasks, but they were found--favoring whites--on maplike and mathematical synthesis tasks. This is in line with other reports and speculations that Negro children may have a defect involving spatial or visual information processing abilities rather than a global IQ-deficiency. (Farnham-Diggory, 1970, p. 35)

The deficit model, when applied to an entire population, especially a minority or racial population, seems to limit potential assistance to that group because it channels thinking in ways that emphasize weaknesses rather than strengths, and it interprets differences from the norm as individual deficits.

The School-as-Failure Model

The inference of the school-as-failure model is that because the problem is not in the children, it must be in the schools and teachers, that is, curricula are not relevant, teachers are not sensitive to the experiences that are important in the background of the children, and the methods of school operation do not reflect the needs of the children served. Hess et al. (1971) suggested that the term "culturally deprived child" used in the deficit model, in the school-as-failure model becomes the "educationally rejected child."

The foci for change in this model are the teacher, the curriculum, and the school. Sensitivity training for the teacher, student participation in decision making, relevant course work, and employment of community members who have no professional educational training, are some of the methods that have been used to promote change.

The school-as-failure model's perspective appeals to liberal middle-class whites as well as minority groups, and the appeal is reflected also in the current popularity of the British Infant School model, often termed the "open classroom." Such writers as Silberman (1970), Murrow and Murrow (1971), and Featherstone (1971) have proposed changes in the school on the basis of this orientation.

The school-as-failure model places the responsibility on the institutions to change so that they measure up to the needs of the students they serve. Performance contracting and the new emphasis on accountability to parents reflect this trend.

The Cultural Difference Model

This model holds that each individual grows up in a specific subculture that has a unique style of interpersonal relations and intellectual operations. To make value comparisons across cultures does not help to develop effective educational programs. The strengths of each culture should be emphasized, and the major goal of education in a multicultural environment should be to build upon these strengths rather than to attempt to bring the groups into conformity with an arbitrary standard of performance. Recent reviews of the literature have taken this tack in discussions of developmental problems (e.g., Horowitz & Paden, 1973). This model has gained attention through the work of the language development specialists (Baratz & Baratz, 1970; Casden, Baratz, Labov, & Palmer, 1971).

The goal of education in the cultural difference model is not the development of a specific educational program in which each group learns to a standard, but the sharing of diverse cultures in a truly pluralistic approach.

The Social Structure Model

In the view of persons accepting this model, the burden of responsibility for how an individual has developed rests with the general structure of society--its demands and press upon the individual--especially during the process of socialization within the family. The "social inheritance" is transmitted, Lysenko-style, from one generation to another. Changes made in the general social structure by providing jobs, opportunities, and power to people who do not have them should receive priority policy attention. An example of this position is given in a review of intellectual development research:

> Our conclusion is that improvement in the social environment of groups at a marked social disadvantage can bring about substantial improvement in IQ levels and a decline in the frequency of mild mental retardation. Only radical environmental change can be expected to bring about rapid improvement. It seems likely that the greatest advantage will come from a serious attack on poverty and its concomitants in unemployment, deteriorated housing, physical environments, and poor and inappropriate schooling. (Stein & Susser, 1970, p. 64)

Although this model pays little attention to schools and school programs for children, it supports the alteration of school operation and control through major shifts in power to parents and groups seeking alternatives to the status quo in education.

Preschool Education

Special education programs for the educable mentally retarded child at the preschool level have not escaped the conflicts and problems related to the disadvantaged child. Accurate identification is difficult during the preschool years, and the full force of the social changes occurring within the country mitigates against early programing, if it is under the auspices of special education. Hodges, McCandless, and Spicker (1967) at Indiana; Karnes, Hodgins, and Teska (Note 2) at Illinois; and our own Ypsilanti projects--the Ypsilanti Perry Preschool Project (Weikart, Deloria, Lawser, & Weigerink, Note 5) and the Ypsilanti Preschool Curriculum Demonstration Project (Weikart, 1972)--are among the very few studies which have been attempted with an admitted special education population. Head Start and most other operational programs classify children in terms of economic status and purposely ignore the issue of intellectual diagnosis entirely. I have been called to account by many concerned parents and educators for categorizing the students in my samples as "educable mentally retarded." Our answer has been relatively simple: If the youngsters could be certified to meet state requirements for special education, then funds would be provided to support a preschool for them. It seemed to me in 1960, as it seems now, that diagnosing 3-year-olds as "functioning most like children who are primarily mentally retarded" in order to provide early support for their development was and is justified. Whether this decision was wise will be demonstrated over time as we follow up the results of our work.

Several good resumés of early education programs have been published. Horowitz and Paden (1973) gave an excellent summary of the important current work and the general trend of research and research questions critical to the field. They especially took to task those of us who have operated with disadvantaged children from a deficit model; they prefer the cultural difference model. A rapid look at the international field is provided by Sjølund (1971). (Their book is in

Danish but it has an intriguingly extensive English summary, as well as an extensive bibliography.) Although a specific review of early education and retardation is not available, the subject is included in Stein and Susser's (1970) extended article. Finally, many topics in early education and special education are touched upon forcefully in the series of articles included in the book on day care (Grotberg, 1971) which was published by the Office of Economic Opportunity.

Two major issues have been the focus of our--High/Scope's--research in preschool education and curriculum development: (a) the long-term impact of preschool education upon later school performance, and (b) the relative impact of preschool education when differing educational procedures or theoretical models are employed.

Impact of Preschool Education

Data are available from several studies which have passed beyond the category of immediate results and into long-term follow-up status. The most complete data are from Skeels (1966); he reported 30-year follow-up results of an early preschool and adoption study by the Iowa Child Welfare Research Station. The social and occupational adaptation of the experimental group children who eventually went into adoptive homes was impressive when compared to the almost total lack of adjustment in the control-group children who did not participate in the preschool and who remained institutionalized. This finding gives considerable support to the notion that although immediate impact of a project may be difficult to ascertain, long-term results may be favorable when the intervention leads to a basic improvement in the child's general environment. Because the youngsters in the control group were unable to leave the state institution and did not have the opportunity to live in a normal environment, the results may be seen as evidence of a contrast between "normal" and deprived environments.

Klaus and Gray (1968) reported on the children in their experimental group who had attended 2 or 3 summers of preschool and had had 1 or 2 years of weekly home teaching by a trained project staff member. In their seven-year follow-up report, the authors concluded that although there seemed to be a definite spreading of the project's impact to other children in the community and to younger siblings, by the fourth grade no significant achievement differences were found between control and experimental groups. However, a significant difference in Stanford-Binet IQ scores was noted in favor of the experimental children. It is a remarkable achievement to have sustained an impact on intellectual development through the seventh year of a study and four years after formal intervention.

Karnes et al. (Note 2) conducted a curriculum comparison study in which two structured curricula (the Ameliorative curriculum, operated by Karnes, and the Direct Verbal curriculum, operated by Bereiter & Englemann, 1966) were compared; a traditionally oriented nursery program was used for baseline data instead of a no-treatment control group. At the end of the first grade, no difference in Stanford-Binet scores was found between the children in the two experimental programs and those in the traditional group. However, the general academic progress of the children in the two experimental programs was better than that of the children in the traditional program.

The Ypsilanti Perry Preschool Project

The Ypsilanti Perry Preschool Project (Weikart et al.,Note 5) was an experiment to assess the longitudinal effects of a two-year preschool program which had been designed to compensate for the functional mental retardation found in some children from disadvantaged homes.

The study is not complete in that follow-up is still underway (the oldest children are in twelfth and the youngest in eighth grade) but enough data are available on the first five years of the project to support some tentative conclusions.

The program, operated from September 1962 to June 1967, consisted of daily cognitively oriented preschool classes accompanied by weekly home-teaching visits. The population from which the sample was selected was black and economically disadvantaged. Children were assigned to either an experimental or a control group in an essentially random manner, except that the two groups were matched on socio-economic status and Stanford-Binet scores. Instruments used to evaluate program impact were the Stanford-Binet, Leiter International Performance Scale, Peabody Picture Vocabulary Test, Illinois Test of Psycholinguistic Abilities, California Achievement Test Battery, and several parent-attitude instruments and teacher ratings of children.

The preschool curriculum that evolved during the five years of the project was derived mainly from Piagetian theory and focused on cognitive objectives (Weikart, Rogers, Adcock, & McClelland, 1971). Emphasis was placed on making the curriculum flexible enough for the teacher to gear classroom activities to each child's level of development. Verbal stimulation and interaction, sociodramatic play, and the learning concepts through activity were considered more important than social behavior and other traditional nursery school concerns. Weekly home-teaching visits gave each family an opportunity to interact with the child's teacher. The parents were encouraged to participate in the instruction of their children, with the goals of improving their relationships with school and teachers and involving them in the education process. The teacher's child-management techniques indirectly suggested to the mother alternative ways of handling children. Group meetings were used to reinforce the changes in the parents' views of their children's education.

Five pairs of experimental and control groups were used in five replications of the basic experiment. This technique, referred to as small-sample replication, offered two advantages that helped to enhance the conclusiveness of the results: (a) By using a small sample in each replication, better quality control of the classroom operations could be achieved, and (b) consistent results from the five independent experiments were far more convincing than a single significant result. Each of the five pairs of experimental and control groups was called a "Wave" and was given a number from 0 through 4. Waves 0 and 1 started preschool in the fall of 1962; Wave 4, the last one, began in the fall of 1965 and completed the second year in June 1967. Each new Wave of children entered the program at age 3 and remained in it for two years.

General Results

The general findings from the project are as follows:

1. The children who participated in preschool obtained significantly higher scores on the Stanford-Binet IQ test than the control-group children during preschool and first grade. By second grade, the difference in scores was no longer significant (Fig. 1).

2. The children who participated in preschool obtained higher scores on achievement tests in elementary school than the control group. This difference attained significance in the third and fourth grades (Table 1).

3. The children who participated in preschool obtained better ratings by elementary school teachers in academic, emotional, and social development than the control group children. This trend continued through the fourth grade. (For the data supporting this finding, see Weikart & Bond, Note 4.)

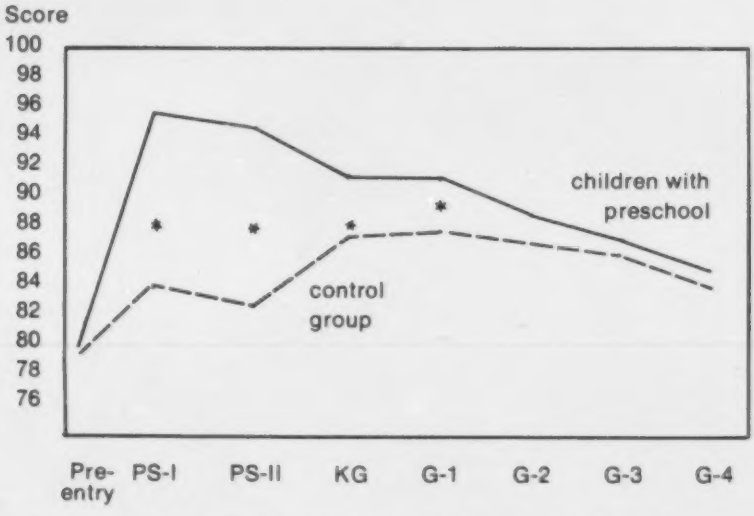

Figure 1. Stanford-Binet Scores for experimental and control groups, Waves 0-4, Ypsilanti Perry Preschool Project. The number of children tested at a given time ranged from 93-123. Except for the pre-entry test, all tests were given in the spring. PS = Preschool; K = Kindergarten; and G = Grade. *$p < .05$.

Table 1

California Achievement Test Data for
Experimental and Control Groups
Ypsilanti Perry Preschool Project

		Experimental Group		Control Group		Significance
Grade	Wave	N	Raw Score	N	Raw Score	of F test
1	0-4	53	97.1	60	84.4	$< .10$
2	0-4	47	142.6	56	126.5	N.S.
3	0-4	54	172.8	55	145.5	$< .05$
4	0-4	49	225.5	40	199.3	$< .05$

Grade Retention and Special Education Placement

One of the most important debates in preschool education has centered on the criteria of effectiveness. Intelligence and achievement tests, teacher ratings, and many other devices which are used to obtain immediate outcome information have been held to be insensitive to the finer effects of preschool on the young child's development. One of the specific goals of the Ypsilanti projects has been to follow the

development of the participating children long enough to study the impact of preschool upon special education placement, retention-in-grade, dropout rates, teenage crime rates, and the like.

Using the most recent data from the original Ypsilanti project, Figure 2 graphs the grade and special education enrollment for Waves 0-4, as of the fourth grade. The most striking finding is the different between the experimental and control children. For the experimental children, 17% are not at the expected grade level in regular classes: 15% are in special education classes and 2% are over age in grade. For the controls, 39% are not at the expected grade level: 24% are in speical education classes and 15% are over age in grade.

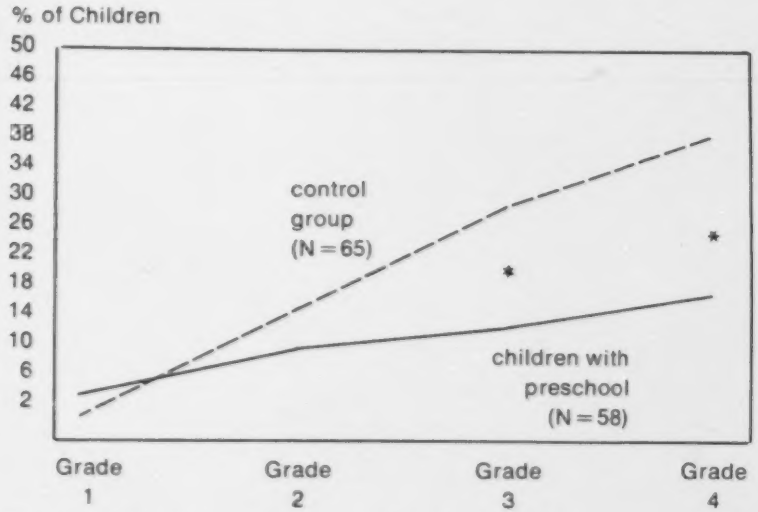

Figure 2. Percentages of experimental and control group children, Waves 0-4, retained in grade or placed in special education classes, grades 1 through 4, Ypsilanti Perry Preschool Project. *$p \leq .05$.

Preschool education for children initially seen as educable mentally retarded has attracted wide concern, and rightly so, because of some of the questionable assumptions underlying the provision of educational programs for them. Results of the Ypsilanti Perry Preschool Project suggest that children who experience early educational intervention are better able to manage later school experiences, as measured by capacity to proceed through school at regular grade placement and avoid special education services or retention-in-grade.

Does it Matter Which Curriculum is Employed?

The second question in which we have been interested is the relative impact of preschool education when differing educational procedures or theoretical models are followed.

Because preschool can make a difference under certain conditions, it is important to know if the impacts on children of widely ranging early education curricula can be differentiated. Inasmuch as it is unlikely that any *particular* program with a given orientation is more effective than any other similarly styled program, it would seem reason-

able to assume that general approaches differ significantly in the ability to help preschool children. This assumption is especially important with the advent of academic skills training programs that purport to accelerate the development of the child through various training procedures.

Programed, open framework, and child-centered approaches differ widely on a number of important theoretical and practical issues, including curriculum supervision for staff, adaptability of the program to specific educational needs of minority and regional groups, breadth of curriculum focus, recommended procedures for child management, teacher acceptability of the curriculum, and assumptions about how children learn. The basic question, however, is how does each curriculum model affect the immediate and long-term intellectual and academic performance of particpating children?

Although debate over evaluative criteria is considerable, third-grade achievement scores on standardized tests are generally accepted as appropriate. There is less agreement about the use of intelligence tests, such as the Stanford-Binet, as measures of immediate outcome at the end of the preschool experience. At the present time, however, no acceptable alternative measures are available for reliably measuring intellectual development or the more general capacities, from problem solving to creativity. The scores from Piagetian measures of cognitive abilities tend to be so closely correlated with Stanford-Binet scores that their use is questionable as a substitute assessment procedure, although they may be invaluable in the design of research projects using open framework curricula. In any case, we have little basic information about the relative effectiveness of particular preschool curricula.

Some years ago, a review of preschool research found that the few programs that were effective in obtaining immediate gains on intellectual measures with some indication of increasing academic success could be classified as *structured* (a category covering for the most part the programed and open framework curricula). Weikart (1967) concluded that

> preschool projects with the disadvantaged child must provide planned teacher action according to a specific developmental theory in which the primary goals are cognitive and language development. . . .The traditional nursery school methods (a category covering Child-Centered). . . .are ineffective in accomplishing the basic goals of preschool intervention with the disadvantaged child. (p. 180)

In a subsequent review of several studies of programed, open framework, and child-centered curricula, Bissell (1970) also concluded that for disadvantaged children preschool programs providing highly structured experiences are more effective than programs lacking these characteristics in producing cognitive gains. Although such reviews underscore the ineffectiveness of child-centered curricula with disadvantaged children, the question of the relative effectiveness of programed and open framework models is still alive.

Ypsilanti Preschool Curriculum Demonstration Project

In an effort to answer the question of the relative effectiveness of programed and open framework models, the Ypsilanti Preschool Curriculum Demonstration Project was established in the fall of 1967. The experimental programs selected were a *cognitively oriented curriculum* (an open framework model) and a *language training curriculum* (a programed model).

The *cognitively oriented curriculum* had been developed over the

five years of the Ypsilanti Perry Preschool Project (Weikart, 1967, 1972). It is a carefully structured program of our own design based on methods of "verbal bombardment," principles of sociodramatic play, as defined by Smilansky (1968), and principles derived from Piaget's theory of intellectual development.

The *language training curriculum*, developed by Bereiter and Englemann (1966) at the University of Illinois, is a task-oriented program employing techniques from foreign language training. It includes direct teaching of language, arithmetic, and reading.

To complete the spectrum, a third program was established to represent the traditional approach: the *unit-based curriculum* (a child-centered model). This curriculum emphasized the social-emotional goals and teaching methods of the traditional nursery school.

The children in the curriculum study were functionally retarded 3- and 4-year-olds from disadvantaged families living in the Ypsilanti school district. They were stratified according to sex and race and were randomly assigned to each of the three treatment groups. Two teachers were assigned to each curriculum model after they had had an opportunity to express a preference. Each taught class for half a day and then conducted teaching sessions in the homes of their pupils, each for 90 minutes, every other week, following the same curriculum style as the classroom program. An essential demonstration aspect of the project was that all three programs had clearly defined weekly goals. The curriculum implementation followed a carefully planned daily program designed independently by the three teams of teachers to achieve the goals of each curriculum. This provision for teacher involvement was a crucial aspect of the overall project.

Much to our surprise, each of the three programs did unusually well on all criteria (Weikart, 1972), greatly exceeding the improvement expected from general habituation and the rapport that leads to better test-taking ability. More important, the initial findings indicated no significant differences among the three curricula on almost all of the many measures employed in program assessment: several intelligence tests (average Stanford-Binet gains in the three programs by 3-year-olds were 27.5, 28.0, and 30.2 points in the first year), classroom observations, observations in free-play settings, and ratings of children by teachers and independent examiners. These data were essentially replicated at the end of the project's second year. The basic conclusion is that the operational conditions of an experimental project are far more potent in influencing outcome than the particular curriculum employed. The curriculum is more important for the demands it places upon the project staff in terms of operation than for what it gives the child in terms of content. Specifically, I would make two points regarding curriculum and the education of disadvantaged children.

1. *Broad curricula are equivalent.* As far as various preschool curricula are concerned, children profit intellectually and socio-emotionally from any curriculum that is based on a wide range of experiences. A child has the potential to develop cognitive skills and good educational habits if he is presented with a situation requiring their expression. Kohlberg (1968) concluded that a child needs broad, general forms of active experience for the adequate development of her/his cognitive abilities; a variety of specific types of stimulation are more or less functionally equivalent for development. In short, no specific curriculum has the corner on effective stimuli, and children are powerful enough consumers to avail themselves of what the market offers.

2. *The curriculum is for the teacher, not the child.* The primary purposes of a curriculum are (a) to focus the energy of the teacher on a systematic effort to help the individual child to learn; (b) to

provide a rational and integrated base for deciding which activities to include and which to omit; and (c) to provide criteria for others to judge program effectiveness so that the teacher may be adequately supervised. The successful curriculum is one that permits this structuring of the teacher's activities and that guides her/him in the task of adapting theory to the actual behaviors of the children. An unsuccessful curriculum is one that permits the teacher to give her/his energies to areas or fails to give her/him clear guidelines for using time to plan, interact with children, and avail her/himself of critical supervision.

The basic implication of the Curriculum Demonstration Project's findings is that a shift in focus is necessary for preschool education. The heavy emphasis on curriculum development, although important, has greatly overshadowed the need for careful attention to other components, including what we call the "staff model"; when these components are held as constant as possible, immediate results are not affected by the curriculum model.

The data are not complete for the Curriculum Demonstration Project--we must await the long-term follow-up study as the children progress through elementary school--but I find myself at a very different place from what I had projected back in 1966 when the project was conceptualized. I had expected then to find immediate differences on most measures among the three curriculum models. Instead, I found, during the time that I was able to maintain equal momentum and staff commitment for the three programs, that equal results were obtained on most measures, from standardized intelligence tests to classroom observations and teacher ratings. From this situation, two essential points emerge regarding the operation of effective preschools:

I. Planning. Detailed planning for daily operation is absolutely critical. Experienced teachers can "wing it" without plans by following routine practices which both they and the children slide into without trouble. However, the moment planning as an organized force ceases or diminishes in its central focus, program quality drops. Planning has several effects, including (a) bringing the adults in the program together and forcing the integration of their ideas so that they respond with purpose to the children; (b) producing a forward momentum or pacing to the program that creates novelty and excitement for the children as well as the staff; (c) serving as a clearing house for interpersonal feelings that make the difference in how the staff relate to one another and the children; (d) producing in teachers a clarity of perception of each child, especially when part of the process is evaluation of completed curriculum activities; and (e) providing a forum in which the ideas generated by the method or theory being followed can be expressed and discussed to give an overview and total direction. Basically, teachers find it highly satisfying to outline the major problems children face in dealing with the world, as represented by the classroom, and to plan ways of facilitating the resolution of these problems. However, planning is also one of the most difficult things to ask of a teaching staff.

II. Supervision. Whereas planning integrates the basic content and expression of the program, supervision makes it happen. Adequate supervision forces the teachers to consider the central issues of their curriculum model. It helps the staff to recognize when they are getting off the track or marking time. The supervisors' tasks include (a) giving direct assistance in the classroom; (b) reviewing the plans the teachers have prepared and observing their implementation in the classroom; (c) raising questions for the staff about program operation, planning, teaching, and general functioning; (d) providing in-service training, which can include demonstration teaching and the video-taping of key lessons or activities, based upon the knowledge

Table 2

Stanford-Binet Data for Curriculum Demonstration Project

	Fall Entering Year		Spring Entering Year						Difference Fall Entering Year
	Mean	Standard Deviation	Mean	Standard Deviation	Difference	(N)	Mean	Standard Deviation	
Wave 5[a]							*Spring 2nd grade*		
Cognitive (N = 11)[b]	75.3	6.1	98.6	12.8	+23.3		86.8	10.4	+11.5
Language (N = 8)[c]	73.9	5.3	98.2	9.4	+24.3		81.1	6.8	+ 9.2
Unit-Based (N = 8)[d]	76.4	4.5	94.1	2.4	+17.7		91.1	9.1	+14.9
Wave 6							*Spring 1st grade*		
Cognitive (N = 5)	83.2	4.8	110.8	12.3	+27.6		102.8	19.7	+19.6
Language (N = 8)	84.4	3.2	114.6	6.1	+30.2		102.8	6.6	+18.4
Unit-Based (N = 8)	73.6	6.9	101.1	7.1	+27.5	(7)	98.3	11.2	+25.0
Wave 7							*Spring kindergarten year*		
Cognitive (N = 7)	79.9	7.3	102.3	13.8	+22.4	(6)	92.2	12.2	+12.3
Language (N = 8)	78.3	6.0	102.3	13.9	+24.0		91.4	15.8	+13.1
Unit-Based (N = 8)	84.3	3.6	101.9	7.4	+17.6	(6)	89.7	5.9	+ 5.4

[a] Wave 5 is the transition wave from the 1962-1967 Perry Project.
[b] Attended two years of preschool as 3- and 4-year-olds.
[c] Tested only as 3-year-olds; attended Language program as 4-year-olds.
[d] Tested only as 4-year-olds Fall 1967; attended Unit-Based program as 4-year-olds.

the supervisors have gained from classroom observations; and (e) refereeing the many problems within the teaching teams, bringing difficulties into the open rather than allowing them to be smoothed over, because genuine problems with children and among staff are the basis for program improvement, and smoothing them over avoids the opportunity for development they present. On the whole, supervisors serve as the balance wheel in the operation of the curriculum model, maintaining, through supportive services, dedication, and knowledge, the momentum which the staff has generated.

Additional Longitudinal Results

One of our main concerns, of course, has been what happens when children who have attended these various programs reach elementary school. It is possible to point to similarities of impact at the preschool level where demonstrable academic skills are not necessary and yet find great differences in performance during later schooling because of the different kinds of preparation given the children through the different curriculum models.

Tables 2 and 3 show the results of the Stanford-Binet follow-up data and achievement test scores. In Table 2 the data are presented for the fall of entering year (note the exceptions for the transitional Wave 5), spring of entering year, and then for the last testing in the spring (June) of 1971. Thus, Wave 5 has completed second grade, Wave 6, first grade, and Wave 7, kindergarten. No statistical tests are included yet it is clear from inspection that although all groups have shown gains, there is little difference in mean Stanford-Binet scores among the groups participating in the three programs. The striking finding is the durability of the gains, especially for Wave 6. Using the original Ypsilanti Project experimental and control groups for contrast (see Fig. 1), it is clear that Waves 6 and 7 are performing better than the earlier experimental groups. The Wave 5 data for second grade parallel the findings of the earlier experimental waves.

Table 3 presents California Achievement Test data for grades one and two. Wave 6 was clearly a superior group with achievement parallel to that usually achieved by children in second grade. The significant finding for Wave 6 was the failure of the language-training students to sustain the pace maintained by children from either the cognitive or unit-based programs. Nevertheless, they achieved at a

Table 3

California Achievement Test Data for
Curriculum Demonstration Project

Program	Wave	N	Raw Score	Percentile
		Grade 1		
CD Cognitive	6	5	143.6	42%
CD Language	6	6	118.8	24%
CD Unit-Based	6	6	146.8	46%
		Grade 2		
CD Cognitive	5	11	151.0	Norms not applicable
CD Language	5	8	153.4	Norms not applicable
CD Unit-Based	5	8	150.3	Norms not applicable

higher level than the original Perry Preschool project group (Table 1). Wave 5 did only slightly better than the original project experimental waves but, nevertheless, better. *Thus, in Wave 5 there are no real differences in achievement levels among the children from the three curriculum models.*

These preliminary data suggest very strongly that the magic of the programed approach is almost purely illusory. When a youngster leaves a programed approach, he apparently knows what he has been taught but he is no better equipped to solve increasingly complex educational problems than youngsters taught by different approaches, such as open framework or child-centered; indeed, on the basis of Wave 6 data, he is not so well prepared. The data presented here are too tentative to permit clear conclusions, but I think that those of us who ask more of education than skill training can breathe a little more freely.

The question we have been dreading is, have we sacrificed the capacity of our youngsters to improve their "skill" learning by emphasizing concept-oriented learning through developmental approaches? These data suggest that, on the contrary, there is a strong possibility that the skills-focused preschools may be sacrificing later learning potential for immediate outcomes. A hint of support for this position can be drawn from Miller et al.'s (Note 3) progress report on her curriculum comparison project. Children who were taught by a programed method and then entered regular classrooms performed at the lowest level of any group, including the controls. "In short, if their Readiness scores are predictive of achievement in first grade, regular kindergarten was a disaster for Bereiter-Englemann children" (Miller et al., Note 3, p. 31).

While the children in our programed curriculum were learning skills, and the open framework and child-centered curricula children were experiencing sequenced concepts and experimenting with materials, what was being learned? Apparently the task now is to return to the programs themselves and start looking at the processes the children experienced during their participation. Here, then, is a strong case for classroom observation to see what specific changes occurred.

Apparently, achievement and intellectual development can be guaranteed by a strong program operated under a good staff model. What we need to know now are how less tangible things such as creativity, initiative, and self-direction are developed under different program models. These attributes cannot be measured easily; it would seem that they are more likely to be developed if they are distinctly present in a program and experienced by the child.

Summary

Preschool education has come a long way. Initially, the basic concept was a program that would ameliorate the deficits the child had suffered as a product of growing up "disadvantaged." With the rise of the civil rights movement and black-Chicano-Indian power, this concept of deficits as the product of the culture, and the routine placement of minority group children in special education after categorizing them as mentally subnormal, were directly challenged. We simply cannot continue such practises any longer, even if we think they are good for the child.

The research results presented in this paper tentatively indicate that some widely held beliefs about preschool education simply are not true. Some conclusions may be stated:

1. Preschools operated in a forceful style can have significant impact throughout the elementary school years in areas that are directly meaningful to teachers, parents, state education officials, and,

of course, the children themselves. "Educable mentally retarded" children given our (open framework) preschool experiences have failed less often and are placed in special education less often than similar children who have not attended preschool.

2. Apparently, both at the time of experience and for at least three years after the preschool program, the style of curriculum does not have a differential effect on the child's intellectual or achievement development rates. Indeed, it is suggested that a programed approach may deter development. A corollary of this conclusion is the belief that different curricula may be important for different children--a hypothesis to explore, although I doubt that it will be found to be true.

3. Curriculum is to help the teacher get about the business of education and has little to do with the child.

4. We do not know enough about how the matrix of a program affects the difficult-to-measure aspects of child development--the child's sense of wonder, his self-respect, his capacity to initiate action, reflectivity, problem-solving ability, and the like--but the characteristics can be studied within the context of any curriculum according to the critical ideas and values of the parents and the educational group. We are not bound to a programed approach, for example, simply because it may give a youngster a short-term advantage in academic skills.

I began by saying that mental subnormality as a diagnostic category is alive and well within the walls of academic institutions and special education classes. I propose that we drop that diagnosis for children under 15, get to the task of identifying high-risk youngsters as early as possible, and get to work. For once in our lives here is a place where we can make a difference. Preschool is alive and well... and looking for a sponsor.

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Language acquisition is the major problem faced by deaf children. Moores, reviewing the efforts which have been made to teach language to deaf children, informs us that the oral-manual controversy, which has raged for more than a century, is alive and well. Unfortunately, neither the oral nor manual approach to language teaching appears to have been overwhelmingly successful in providing deaf children with adequate communication skills. The importance of early childhood intervention programs that begin in infancy is stressed.

Moores emphasizes the importance of looking at the development or acquisition of language in the context of the broad construct of communication. The latter includes nonverbal patterns that begin with the early interactions between care giver (usually the mother) and child. Thus, his findings that deaf parents may be more effective than hearing parents in communicating with their deaf children fits the notion that communication is not necessarily speech. Moores draws upon his own research, other work in this country, and the provocative findings in the U.S.S.R. for this extremely cogent contribution to the early education of hearing impaired children.

Early Childhood Special Education for Hearing Handicapped Children

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The problems and issues currently facing professionals involved in early childhood education are magnified when children with hearing handicaps are considered. The deaf child is unique in that he does not acquire language primarily through the auditory-vocal channel. Other things being equal, the ease with which a child acquires language varies inversely with the severity of his hearing loss. Whereas children are able to use an intact auditory modality to build up automatic integrative mechanisms leading to early mastery of the sound, shape, and sense of language, the child with a severe hearing handicap must depend primarily on vision for his acquisition of language.

The hearing child employs his early knowledge of the phonological structure, or sound system, of his language to choose from the wealth of language forms pervading his environment to master grammatical patterns. The hearing-handicapped child must bypass the sound system in his quest for grammatical competency. Language, perceived visually and tactually by this child, must be received through speechreading, signs, informal gestures, and dactylic (fingerspelling) and graphemic presentation as well as, if possible, through the auditory channel.

The child with normal hearing can be considered linguistically proficient in every sense of the word. He has a basic knowledge of the rules of his language and can produce a potentially infinite number of novel yet appropriate utterances. Because of his mastery of the structure of his language, he can combine and recombine its elements indefinitely. He can produce and understand sentences to which he has never been exposed. When he enters the formal situation in elementary school at age 6 he already has a fully developed instrument for learning--language and communication ability--which he has acquired with little or no conscious effort by his parents or himself.

A child who is unable to respond to speech presents an extremely different picture. He does not acquire language naturally and automatically. Without intensive compensatory training he may be totally nonverbal, and he even may be unaware that such things as words exist. For this child, language is not a facilitating tool for the acquisition of knowledge; rather, it is a formidable obstacle standing between him and the full development of his social, intellectual, and academic potential. Although potentially of normal intelligence, the deaf child finds his range of experience constrained by communication limitations. He suffers from a lack of opportunity to interact fully with and manipulate his environment in meaningful ways. Although impaired hearing itself may have no effects on his intellectual development, if the child is not provided with compensatory tools the impairment leads to impoverished communication skills that set limits on all

aspects of his development.

Much of the curricula in programs for hearing-handicapped children have been designed to teach or develop the linguistic proficiency which hearing children bring to the educational process. Since the means by which most hearing-handicapped children learn a language are different and more laborious, their achievement of language is far below that of hearing children, both qualitatively and quantitatively. Intellectually normal deaf adolescents in North America and Europe, whether or not they have had preschool training, are unable to read at the fifth-grade level (Norden, 1970; Wrightstone, Aranow, & Moskowitz, 1963), lack basic linguistic skills (Moores, 1970a; Simmons, 1967; Tervoort & Verbeck, 1975), and are incapable of expressing and receiving oral communication on anything but a primitive level (Montgomery, 1966; *Report of the Chief Medical Officer of the British Department of Educational Services*, 1964).

In the United States, the education of deaf children long has been the arena of controversy between proponents of oral-only and manual methods of communication. In contrast, educators of deaf children in the USSR, since World War II, have developed what might be termed a multichannel approach (Neo-Oralism) to the teaching of deaf children which appears to be highly productive. Different philosophies underlie the different methods. The ultimate test of any method of teaching the deaf, however, is not the validity of its philosphy but its efficacy in comparison with other methods. Unfortunately, comparatively few such studies are available.

Another problem in the development of language capabilities in deaf children is the restricted interaction between parent and child. Parents of deaf children exhibit the customary signs of guilt, frustration, anger, and insecurity that may be observed in the parents of any handicapped child. Most parents of deaf children have normal hearing and usually they have had minimal exposure to deaf persons. Unlike deaf parents of deaf children, they have great difficulty adjusting to the realization that the deafness is an irreversible loss and the child's major handicap is not the inability to speak but the inability to hear. This difference in parental reaction to the handicap seems to be reflected in part in the academic achievement of the children.

Evaluation of Preschool Programs

Although preschool programs for the deaf have been in operation for generations, there are almost no educational guidelines for establishing their effectiveness. In view of the strong opinions prevalent in the field of education for the deaf, it is somewhat surprising to find a lack of comparative data on different approaches to early education. Most of the literature cited as research is limited to description, defense, and praise of a program by the person who developed it or one who is in some way closely related to it. With the exception of a possible tape or audiogram, no data are presented.

Investigations of preschool programs for the deaf parallel the research into early intervention programs for the disadvantaged. Despite all the enthusiasm and subjective reports of success, there is little to suggest that the programs have had much lasting effect on children. Table 1 presents some studies of the effectiveness of oral-only preschool programs in comparison with(a)no preschool experience; (b) the Neo-Oralism Method used in the USSR and its closest American equivalent, the Rochester Method (children receive information through speechreading, fingerspelling and residual hearing); and (c) exposure to manual communication through deaf parents and no preschool experience. In only one study (Balow & Brill, 1975) were the students with

oral-only preschool experience later found to be superior to the control group.

In the McCroskey (Note 2) study, children who had participated in a home-centered program with auditory emphasis were found to be little different from children who had received no training. What differences existed tended to favor the control group, those with no preschool training. McCroskey postulated that the experimental group consisted of children who were basically inferior and who had been brought to a position of equality with the group by the intervention. His assumption must remain conjecture because no pre-experimental data were gathered on the children.

Vernon and Koh (1972) and Balow and Brill (1975) both investigated graduates of the John Tracy Clinic preschool program who went on to attend the California School for the Deaf, Riverside (CSDR). In the Vernon and Koh study, the performances in speech, speechreading, academic achievement, and reading of three groups of children attending the CSDR were compared. The first group consisted of 69 students who had graduated from the Tracy Clinic between 1944 and 1968. (The authors noted that 123 students were graduated from the Clinic during the 1944-1968 period and 56% of them entered CSDR.) The second group included children who had received no preschool training and who were matched to the Tracy graduates on age, IQ, and sex. The third group was made up of deaf children of deaf parents. No differences were found between the first two groups on speech, speechreading, academic achievement, or reading. As compared to the first two groups, the third group-deaf children of deaf parents--was superior in academic achievement and reading, but no different in speech and speechreading.

Balow and Brill (1975) examined the records of 16 graduating classes of CSDR from 1956 through 1971. Of the 590 graduates, 299 (about one-half) were from families who had had some experience with the John Tracy Clinic ranging from correspondence courses for parents to six students who had attended the Clinic nursery school program for a few years. The children from these families achieved a mean IQ score on the Wechsler Adult Intelligence Scale (WAIS) of 109.101 and a mean Stanford Achievement Test (SAT) Battery score of Grade 7.373. Both scores were significantly superior to those of graduates with no experience with the Tracy Clinic; their mean scores were IQ of 106.487 on the WAIS and Grade 6.644 on the SAT.

Of the clinical group, 21 had had 3-4 years of experience in preschool classes at the Tracy Clinic; they achieved the highest mean scores: IQ of 115.333 and Grade 8.761. Surprisingly, those identified as attending summer session only (N=36) achieved a higher mean score on the SAT than the students who attended preschool classes for one or two years: Grade 7.036 as compared to Grade 6.540. The mean WAIS scores for the two groups showed considerably less disparity: 107.527 and 107.133, respectively.

Inasmuch as both Vernon and Koh (1972) and Balow and Brill (1975) used students from the CSDR, one would expect great overlap in their samples. (Balow and Brill did not cite the Vernon and Koh work in their references.) Vernon and Koh reported on the 69 students who had graduated from the Tracy Clinic from 1944 to 1968 and had entered CSDR; Balow and Brill reported data on only 21 students who had graduated from the Clinic. Although the Balow and Brill data were restricted to graduates of CSDR from 1956 through 1971, the number of Tracy Clinic graduates in their sample seems small.

Balow and Brill compared Tracy Clinic to non-clinic graduates, and CSDR graduates with at least one deaf parent to CSDR graduates with hearing parents (see Table 2), but they did not compare Clinic graduates to CSDR graduates with deaf parents. Examination of their tables shows that the 34 CSDR graduates with at least one deaf parent

Table 1

Studies of the Comparative Effectiveness of Oral-Only Preschool Programs

Investigator(s)	Preschool Program(s)	Results
	Oral-Only Preschool vs. No Preschool	
Phillips (Note 1)	Lexington School for Deaf White Plains School for Deaf Illinois School for Deaf Pennsylvania School for Deaf American School for Deaf New Jersey School for Deaf	No differences in language arts, arithmetic, and socialization by age 9.
Craig (1964)	Western Pennsylvania School for Deaf American School for Deaf	No differences in reading and speechreading.
McCroskey (Note 2)	Atlanta Speech School (Home-based program)	No differences.
Vernon & Koh (1972)	John Tracy Clinic	No differences in speech, speechreading, general achievement, and reading.
Balow & Brill (1975)	John Tracy Clinic	Students with preschool superior in intelligence and achievement.

Oral-only Preschool vs. Rochester Method/Neo-Oralism

Morozova (1954)	Schools in Soviet Union	Children with fingerspelling plus oral instruction master in 2 years material requiring 3 years under oral-only method.
Quigley (1969)	American School for Deaf Indiana School for Deaf	Rochester Method students superior in: (a) fingerspelling; (b) speechreading; (c) 5 of 7 measures of reading; (d) 3 of 5 measures of written language. Oral-only students superior in: (a) 1 of 5 measures of written language.

Oral-only Preschool vs. Deaf Children of Deaf Parents with No Preschool

Vernon & Koh (1972)	John Tracy Clinic	Students with deaf parents and no preschool superior in reading and general achievement. No differences in speech and speechreading.

achieved a mean SAT score of Grade 9.203, approximately two years superior to the mean SAT score of 7.373 achieved by CSDR graduates with Tracy Clinic preschool experience. Compared to the highest achieving clinic group, those with three or four years of preschool experience, students with deaf parent(s) achieved at a level approximately one-half year superior (Grade 9.205 compared to Grade 8.761). The group with deaf parent(s) earned a mean WAIS score of 114.333, compared to the mean of 115.333 for the three- and four-year preschool group, which suggests that any superiority in achievement was not due to intellectual differences between the two groups.

Early Intervention Programs in the USSR

Shortly after World War II, educators of the deaf in the Soviet Union concluded that education of the deaf was a complete failure which could be traced to two basic misperceptions: (a) The inability to recognize that speech and language are distinct entities; equating the two led educators to emphasize articulation skills at the expense of linguistic and cognitive development. (b) An unfortunate tendency to consider the child a relatively passive organism; the result is classrooms so structured that almost all conversation and activities are teacher initiated. A new system, labeled Neo-Oralism, was developed which had three basic goals:

1. to give the child tools of communication, especially expressive communication, at an early age;
2. to change a passive youngster to an active one with initiative in learning; and
3. to free the child and his language from the immediate situation.

From the beginning, instruction concentrates on practical activities to encourage independence. There is extensive use of toys made of paper, plastic, textiles, papier-mâché, and Plexiglas. Emphasis is placed on arts and crafts to develop concepts of position and color as well as to encourage creativity. Activities with practical application include work with illustrations and figures. Measuring and counting experiences are numerous. A large portion of the child's early education is devoted to organized observation of the environment. (Moores, 1972, and Morkovin, 1960, have described the system in detail.)

According to the position of Soviet educators, the Russian language can be expressed in three separate modes: oral speech, written speech, and dactyl speech (fingerspelling). Each is considered a separate form of the Russian language and is used as soon as possible.

Because oral and written speech are so difficult for the very young child, fingerspelling is introduced and used from the beginning because even children who cannot speak or write can fingerspell. Both parents and teachers are expected to spell complete sentences at all times. For many children, as they develop mastery over spoken and written forms of Russian the use of fingerspelling is phased out.

Morozova (1954; Table 1) reported that 3- and 4-year-old children could acquire in 2 years that which previously required 3 years under the Pure Oral Method (POM). Moreva (Note 3) replicated Morozova's study and reported that 3-year-olds could master fingerspelling in from 2-8 weeks; 2-year-olds required 5-6 months. Martsinovskaya (1961) and Titova (1960) found that fingerspelling facilitated the separation of words into their phonetic composition and accelerated vocabulary growth. Karsunskaya (1969) reported that if everyone around the child fingerspells, the language mastery process becomes like that of a hearing child. However, children do not rely on fingerspelling even though it is easier. She reported that it aids in the development of

speechreading and appears to effect speech neither positively nor negatively.

Zukov (1962) claimed that a child entering school at age 7 would learn under traditional methods 200 words and 8 sentence patterns; now, 550-600 words and 80 patterns are learned the first year. Zukov reported that a child who has gone through preschool now has as many as 2000 words in his vocabulary upon entering the elementary program. More important, his language has achieved control over his behavior. He has words to control and direct his actions.

Research on Neo-Oralism has been conducted on over 70 programs in the Soviet Union. By the early 1960s, its superiority over the traditional Pure Oral Method had been established to the satisfaction of researchers at the Moscow Institute of Defectology, and Neo-Oralism was established officially throughout the Soviet Union.

In an attempt to test the generalizability of the Russians' findings, Quigley (1969) compared a group of preschool children taught under the traditional oral-only method to a group taught simultaneously by speech and fingerspelling, a system known as the Rochester Method in the United States (Table 1). Although it has been used in the United States for almost 100 years, the Rochester Method had never been tried with preschool children, with one exception, lest fingerspelling inhibit the very young child's development. Quigley (1969) reported that children taught by the Rochester Method were superior in fingerspelling, speechreading, written language, and reading, thus supporting the results reported by the Russians.

Hearing-Impaired Students in the Mainstream

Using questionnaires to parents and teachers, Rister (1975) followed up 88 children who had attended the oral-only program at the Houston Speech and Hearing Center. The reports indicated that 55 of the children were in regular and 33, in special education classes. Those in the regular classes were rated as achieving at a higher level and having milder hearing losses. Only 12.1 % (4) of the children in special education classes had hearing losses less severe than 85dB (ISO) as compared to 43.6% (24) of the 55 children in regular classes. The two groups were not matched. The children perceived as having superior oral skills were placed in the regular programs. Prior to leaving the Houston Speech and Hearing Center, the 55 children who were enrolled in regular classes at the time of the study had achieved a mean learning quotient of 112, as compared to a mean of 99 for the 33 children who were enrolled in special education classes at the time of the study.

In an investigation more tightly controlled for hearing loss--only children with losses greater than 75dB were included--Moores, Weiss, and Goodwin (Note 6) concluded,

> Children who have been integrated or "mainstreamed" do not differ in intelligence, reading, arithmetic achievement, ITPA scores or overall communication abilities. They tend to have more hearing and better speech. Other factors appear to be minor. Very little accommodation has been made to the "mainstreamed" students. Mainstreamed students had better speech before they were placed in regular classrooms. Children do not speak better because they are integrated; they are integrated because they speak better. (p. 8)

Functioning of Deaf Children of Deaf Parents Receiving Early Manual Communication

Studies of Deaf Children of Deaf Parents

Because no educational programs have used manual communication with young children until recently, many investigators have turned to the study of deaf children with deaf parents who use manual communication in the home. If the use of manual communication is harmful, then deaf children of deaf parents would be expected to be inferior in academic achievement, psychosocial adjustment, and all aspects of communication, including speech, speechreading, reading, and writing. Table 2 summarizes six studies of such children. In three studies, deaf students of deaf parents were matched to deaf students of hearing parents for comparison purposes; in two studies, the two populations were compared but not matched; and in one study deaf students of deaf parents were matched and compared with recessively deaf students of hearing parents. In all six studies, the results indicate that deaf children of deaf parents are academically superior on the whole to deaf children of hearing parents.

At the California School for the Deaf, Berkeley, Stevenson (1964) examined the protocols of children enrolled between 1914 and 1961 whose parents were also deaf, and he matched them to deaf children with hearing parents. In 90% of the 134 paired comparisons, students with deaf parents had attained a higher educational level at the California School for the Deaf, and 38% of these students entered college. The comparable figure for college admissions of students with hearing parents was 9%.

Meadow (Note 4), comparing 59 children of deaf parents to a carefully matched-paired group of children with hearing parents, reported that children with deaf parents ranked higher in self-image tests and showed an average superiority in academic achievement over their matched pairs. The gap in overall achievement between the two groups increased with age to reach 2.2 years in senior high school. Teachers and counselors rated children with deaf parents higher on (a) maturity, responsibility, and independence; (b) sociability and popularity; (c) appropriate sex-role behavior; and (d) appropriate reaction response to situations. Commenting on the children's reactions to deafness, Meadow (Note 4) stated that children of hearing parents viewed their deprivation in terms of the inability to *speak* rather than the inability to *hear;* and that they tended to ask questions about their deafness at a later age than children of deaf parents.

Vernon and Koh (1970) matched 32 genetically deaf children for sex, age, and intelligence with recessively deaf children who had hearing parents and no early exposure to manual communication. On a standardized achievement test, the deaf children of deaf parents who had been exposed early to manual communication scored higher by an average 1.44 years.

Quigley and Frisina's (1961) study of 16 deaf students of deaf parents from a population of 120 deaf day students (see Table 2) was an unplanned ramification of an investigation of the effects of institutionalization.

In the only study directly comparing the effects of an intensive oral preschool program on children with deaf parents and children of hearing parents, Vernon and Koh (1970) reported that children with deaf parents exhibited a superiority of approximately one full grade in all areas. The children with deaf parents were superior in reading but no different in speech and speechreading.

In the previously cited report by Balow and Brill (1975), graduates with deaf parents of the California School for the Deaf, River-

side, were superior to graduates with hearing parents on WAIS IQ scores (means, 114.333 vs. 107.427) and on SAT Grade level achievement scores (means, 9.205 vs. 6.765). The superiority on SAT achievement is approximately 2½ years.

Implications of Studies

The results reported by Stevenson, Quigley and Frisina, Stuckless and Birch, Meadow, Vernon and Koh, and Balow and Brill (Table 2), although interesting in themselves, must be evaluated in relation to the richer environment to which children of hearing parents theoretically should be exposed. The socio-economic status of children with hearing parents is superior. The language and speech limitations of deaf adults have been substantiated extensively. In addition, deaf children of hearing parents are far more likely to receive preschool training and individual tutoring. Meadow (Note 4) reported that 60% of the children with deaf parents received no preschool training as compared with only 18% of those with hearing parents; and half of the group with hearing parents not only attended preschool but had additional enriching experiences either at home or at a speech clinic. Almost 90% of the hearing families interviewed had had some involvement with the Tracy Clinic correspondence course but none of the deaf families had sent for it.

Vernon and Koh (1970) emphasized that their sample from the Tracy Clinic represented a select group: An IQ of 114 placed a person in the upper 20 percent of the population; the children received intensive oral instruction and auditory training in a three-year preschool program; and their parents received professional group counseling and, in some cases, private psychotherapy to help them adjust to their children's deafness.

Given the higher socioeconomic levels, more adequate linguistic and speech skills, and higher academic attainments to be found in the hearing families, in addition to the preschool educational and speech training provided for children with hearing parents, the educational, social, and communicative superiority of deaf children with deaf parents takes on added significance. One can only speculate on the attainments of deaf children of hearing parents if, in addition to familial, social, educational, and economic advantages, they had benefited from some form of early systematic communication with their parents.

The benefits of the early introduction of the Language of Signs must remain speculation for the present. In view of the fact that deaf children of deaf parents were exposed to the Language of Signs from birth, and because the preschool programs investigated, which showed no results or temporary results, have been oral-only programs, it has been argued that the failure of preschool programs lies in the fact that they have been restricted to oral-only instruction (Vernon & Koh, 1972) and that the addition of manual communication would improve results.

Such reasoning has led to the development of many recent preschool programs centering on a system called Total Communication in which signs, fingerspelling, and oral expression are used. Although the evidence for the superiority of deaf children of deaf parents is substantial, it does not necessarily follow that the use of manual communication in preschool programs will produce better results. At present, no data exist on the preschool level on the comparative efficiency of the use of Total Communication as opposed to either an oral-only method or the Rochester Method. At older ages, the little research that is available suggests that the Rochester Method is superior on a group level (Quigley, 1969: Moores, 1970a).

The lack of data may be traced to two primary factors: (a) The

Table 2

Studies of Deaf Children of Deaf Parents Receiving Manual Communication

Investigator	Comparison	Programs	Results
Stevenson (1964)	134 deaf students of deaf parents matched to 134 deaf students of hearing parents.	California School for Deaf, Berkeley	Those with deaf parents educationally superior in 90% of pair matchings; 38% of students with deaf parents went to college, 9% of those with hearing parents.
Stuckless & Birch (1966)	38 deaf students of deaf parents matched to 38 deaf students of hearing parents.	American School for Deaf Pennslyvania School for Deaf West. Pa. School for Deaf Martin School for Deaf Indiana School for Deaf	Children with deaf parents superior in reading, speechreading, and written language. No differences in speech or psychosocial development.
Meadow (note 4)	59 deaf students of deaf parents matched to 59 deaf students of hearing parents.	California School for Deaf, Berkeley	Children with deaf parents ahead 1.25 years in arithmetic, 2.1 years in reading, 1.28 years in achievement; superior in written language, fingerspelling, signs, willingness to communicate with strangers. More mature, responsible, sociable. No differences in speech or speechreading.

Quigley & Frisina (1961)	16 [illegible] deaf parents out of a population of 120 deaf students.	[illegible] School for Deaf Michigan School for Deaf Pennsylvania School for Deaf Texas School for Deaf Rochester School for Deaf California School for Deaf, Riverside	Children with deaf parents superior in fingerspelling and vocabulary; no differences in speechreading and achievement; children with hearing parents superior in speech.
Vernon & Koh (1970)	32 deaf students with deaf parents matched with 32 recessively deaf students with hearing parents.	California School for Deaf, Riverside	Children with deaf parents an average of 1.44 years superior on academic achievement and superior in reading, vocabulary, and written language; no differences in speech and speechreading.
Balow & Brill (1975)	41 graduates with at least one deaf parent vs. 42 graduates with hearing parents.	California School for Deaf, Riverside	Students with deaf parents superior in intelligence and achievement.

extreme difficulty of evaluating the effectiveness of preschool programs is compounded by the addition of the dimension of deafness. (b) Perhaps an even more inhibiting factor is the highly emotional nature of the question of methodology with deaf children, especially young ones. Some educators firmly believe that the use of any kind of manual communication will prevent a child from developing speech and language and doom him to lifelong existence in a mute subculture. Others firmly believe that depriving the child of just such a system will cause him irreparable linguistic, educational, and emotional damage. Given such a climate, most researchers prefer to investigate other questions. In my opinion, neither concern should be sufficient to deter a search for objective analysis. Educational decisions must be made daily. If no information exists, the decisions will be made on the basis of other, less desirable, factors.

Program Orientation

The oral-manual controversy has dichotomized the field to such an extent that other substantive issues have not received adequate attention. Probably the most important issue is the content of early intervention programs. The majority of present programs have been in the traditional nursery school mold with emphasis on socialization. Guidance of parents may be the major aspect of such a program, and placement contiguous to hearing peers is usually an essential component. Stress is placed on the spontaneous development of language and speech skills. For descriptions of such programs see Griffith (1967), Knox and McConnell (1968), Pollack (1964), and Reed (1963).

A second major development recently noted (Moores & McIntyre, 1971) has been toward child-centered intervention programs with emphasis on the development of cognitive and academic skills. The impetus has grown out of the awareness of recent work with retarded and disadvantaged children, which suggests that the more successful preschool programs contain some structured components with specific academic and/or cognitive training. Reports of investigators such as Bereiter and Englemann (1966), Di Lorenzo (1969), Karnes, Hodgson, and Teska (1968), Spicker (1971), and Weikart (Note 7) are having the greatest impact.

Unimodal and Bimodal Stimulation

The three most common methods used with deaf children today provide simultaneous auditory-visual input. In the oral-only method, the child receives information through speechreading and residual hearing; in the Rochester Method he receives it through speechreading, residual hearing, and fingerspelling; in Total Communication he receives it through speechreading, residual hearing, fingerspelling, and signs. In the latter two methods, the child's attention is on the face of the speaker. Griffith (1967) and Pollack (1964) have criticized these approaches for putting too much emphasis on the visual. They argued that because visual input is easier for the deaf child he will become too dependent on it and never develop his potential residual hearing. Reasoning that the first year of life is critical for the development of auditory language, they advocated a completely auditory program for preschool children. Lenneberg (1967, 1970), on the other hand, took the position that the channel by which language is learned is relatively unimportant, and he reasoned that the early introduction of graphics would enhance the development of both language and speech skills; he included manual communication within his definition of graphics. His theoretical position seems to be close to that of the Russians who first develop language in deaf children on the basis of a graphic (dactyl) system and later transfer it to the auditory-vocal.

The work of Gaeth, who has been studying the effects of unimodal and bimodal stimulation, is of great relevance. The results of his investigations (1963, 1966) with deaf, hard-of-hearing, and normal students suggest that in bimodal presentation attention is directed to the modality that is more meaningful. The results appear to be consistent with other research in the area of unisensory and multisensory stimulation, as reviewed by Travers (1970), but they contradict traditional research efforts in deafness; for example, Numbers and Hudgins (1948) indicated that bimodal reception (look and listen) was superior to visual (look) or audition (listen) alone.

Gaeth (1966) reported that hard-of-hearing subjects, although somewhat inferior, function much as normal subjects in that they attend to the modality that is more meaningful. Deaf subjects consistently attend to the visual modality.

As opposed to possible interference between simultaneous bimodal presentation, Broadbent (1958) and Gaeth (1966) reported no inhibition in the use of two stimuli presented simultaneously in the same modality. If so, this finding could lend support to the simultaneous use of speech and fingerspelling or speech, signs, and fingerspelling with the young child.

At present, the relative efficacy of multisensory stimulation and applications to education of the deaf are unclear. However, a number of fascinating questions may be raised:

1. Can language be developed in the visual-motor channel?
2. If so, can it be transferred to the auditory-vocal?
3. Is visual information processing similar to auditory information processing?
4. Can there be a visual counterpart to short-term auditory memory?
5. What type of stimulation should be recommended for the newly diagnosed hearing handicapped child?

The fifth question presents the crux of the matter. The diagnosis for very young children is often confused. In many cases it is uncertain how much sound he receives and how it is processed. This concern is of special importance for children with etiologies such as ruhella, meningitis, and prematurity in which other complicating factors may exist. With children whose potential for developing language auditorially is difficult to predict, the educator has two alternatives: If he believes the base of language lies in the auditory mode and that visual presentation inhibits it, he can recommend a straight auditory emphasis; the auditory failures can be programed into multisensory systems at a later age. If he believes the base of language lies deeper, he can consider the modality to be relatively unimportant and, whenever in doubt, can provide simultaneous presentations.

If the base of language really is auditory, the first approach will save the auditory children educationally and lose the others. The second approach will lose all children. If the base of language goes deeper, the first alternative again will save the auditory children and lose the others. The second alternative will save all the children.

Given the present state of knowledge, an educator faces a Hobson's choice. As he thinks through the problem, he must be aware that if his orientation is wrong his decision can have lasting detrimental effects on the child.

A Longitudinal Evaluation

A longitudinal evaluation based on a modification of Cronbach's (1957) Characteristics by Treatment Interaction Model was conducted

In cooperation with seven early education programs[1] by Moores and associates (Moores, 1970b, 1974; Moores & McIntyre, 1971; Moores, McIntyre & Weiss, (Note 5); Moores, Weiss & Goodwin, 1973; Moores. Weiss & Goodwin (Note 6). The model is based on the thesis that when results of educational research consist entirely of comparisons between groups, they are of limited value. Such investigations may be neat and produce results but they frequently mask important interactions between individuals and different types of treatments or educational programs. The search should not necessarily be for the "best" method for all children but rather for the preferred method for a particular child at a particular stage of development. A detailed explanation of the rationale was presented by Moores (1970b).

The programs were selected to represent a number of important components of various early intervention systems. They differed on methodology (Oral-Aural, Rochester Method, Total Communication), setting (Day, Residential), orientation (Traditional Nursery, Academic, Cognitive), emphasis (Parent-centered, Child-centered), and placement (Integrated, Self-Contained). Each participating program was considered a strong representative of a particular early intervention model.

The evaluation was designed to avoid what had been perceived as weaknesses in previous evaluations. Among the steps taken were the following:

1. Programs that provided services from time of identification were involved.
2. Programs that served complete, not select, populations were involved.
3. Programs themselves had no formal role in the evaluation.
4. Measures of use of residual hearing were employed.
5. Decisions on inclusion of pupils in the study were made by an audiologist on a "blind" basis, that is, data presented to the audiologist did not identify the program from which a child came.
6. Investigators were able to follow children who entered neighborhood schools, that is, those who were mainstreamed.
7. Measures of expressive and receptive communication abilities were developed and administered in addition to tests of articulation and receptive vocabulary.

Results.[2]

Subjects were tested during the spring each year from 1971 through 1974. All subjects were born between March 1966 and March 1968; by the final testing the average age was 7 years with a range of from 6.0 to 8.0 years.

1. *Academic Achievement.* Achievement of the sample, as measured by the Metropolitan Achievement Test, Primer Battery, was comparable to that of hearing children of the same age in reading, and

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[1]The American School for the Deaf, West Hartford, Conn.; Callier Hearing and Speech Center, Dallas, Tex.; Maryland School for the Deaf, Frederick, Md.; Minneapolis (Minn.) Public Schools; New Mexico School for the Deaf; Rochester (N.Y.) School for the Deaf; St. Paul (Minn.) Public Schools. An eighth program, the Bill Wilkerson Hearing and Speech Center, Nashville, Tenn., withdrew after results of the first year of data gathering were published.

[2]Complete results were presented in detail in the reports themselves and the interested reader is referred to the original sources.

below hearing children in arithmetic. The relatively poor achievement in arithmetic was noted in both 1973 and 1974, suggesting that a general weakness of all the programs involved was an emphasis on reading to the detriment of computational skills. The high reading scores suggested that the programs had provided children with the skills for basic reading. However, since there was evidence that the children lacked knowledge of more complex English linguistic structures (e.g., passives, interrogatives, etc.), it was predicted that the children would show less progress over the years in reading than the standardization hearing population.

In terms of program comparisons, the mean raw scores for reading ranged from 22.69 to 29.50; for arithmetic, from 17.15 to 22.38; and overall, from 39.85 to 51.87. In each case the lowest scores were achieved in Program D, a traditional oral-aural, parent-centered program that emphasized socialization and integration. Program F, which used the Rochester Method, was highest on reading and overall achievement; Program C, a Total Communication, academically oriented program, was highest in Arithmetic.

2. *Illinois Test of Psycholinguistic Abilities* (ITPA). In 1972, 1973, and 1974, the average scores of the subjects on the five visual-motor subtests of the ITPA were almost identical to the norms established for children with normal hearing, suggesting normal functioning in these areas. The deaf subjects consistently exhibited superiority on one subtest, *Manual Expression*. For them, ITPA scores did not correlate with scores on expressive and receptive communication, which suggests that, for young deaf children, the ITPA visual-motor tests may assess underlying cognitive abilities rather than psycholinguistic abilities per se.

In the beginning years of the study, mean scores were quite sensitive to the amount of structure and academic orientation of a program, that is, children in more structured, academic programs scored higher. These differences seemed to disappear by 1974, indicating that previous program differences in the ITPA were transitory.

Table 3

Receptive Communication Scale (Core Items):
Percentage Scores Obtained in
1972, 1973, and 1974

Subtest	1972	1973	1974
	%	%	%
Printed Word	38	56	76
Sound Alone	34	43	44
Sound and Speechreading	56	63	68
Sound and Speechreading and Fingerspelling	61	72	75
Sound and Speechreading and Signs	72	86	88
Total % Correct	50	62	69

Source: D. F. Moores, K. L. Weiss, & M. W. Goodwin. *Evaluation of programs for hearing impaired children.* University of Minnesota Research, Development and Demonstration Center in Education of Handicapped Children, Research Report #81, December 1974, p. 65.

3. *Receptive Communication.* Subjects were assessed in their receptive abilities across five modes: printed messages; sound alone; sound and speechreading; sound, speechreading, and fingerspelling; and sound, speechreading, and signs. Table 3 indicates that for 1972, 1973, and 1974, excluding understanding of the printed word, the least efficient mode was sound alone. Understanding increased with the addition of each element--speechreading, fingerspelling, and signs--and the single most effective means of communication was the combined use of sound, speechreading, and signs. Scores on the printed word increased dramatically from 1972 to 1974 as a function of increased attention to reading in all programs.

Programmatic comparisons of scores in 1974 revealed a number of interesting patterns. Scores on understanding the printed word ranged from 65% for Program D to 90% for Programs A and F. It is significant that Program D also was lowest on the MAT reading tests and Program F was highest (Table 4).

In terms of the four measures of person-to-person communication, the situation was much more complex. Programs D and G at 58% and 53%, respectively, were far superior to the other programs in reliance on sound alone. Children in Program D were trained in the oral-aural method with heavy emphasis on audition. The program G sample all started in the Rochester Method and later were tracked into Oral-Aural or Total Communication classes, with all children exposed to signs. The results suggest that manual communication has no effect, either positive or negative, on residual hearing.

The addition of speechreading to sound provided different patterns. Scores on this measure probably were more important than sound alone because for most deaf individuals the daily face-to-face contact with hearing people involves understanding by means of simultaneous speechreading and use of residual hearing. The scores for this mode ranged from 53% for Program A to 90% for Program G. Analysis of increases in scores from sound alone to sound plus speechreading revealed the least improvement to be 48% in Program F (35% to 83%) followed by 37% in Program G (53% to 90%). Since the two highest scoring programs employed manual communication, it is obvious that manual communication does not detract from either the use of residual hearing or speechreading.

The addition of the fingerspelling component revealed a wide range of scores. The scores for Program B (51%) and Program C (55%) were depressed because B had changed from an Oral-Aural program only during the 1973-74 year, and C began to permit manual communication with a few of its children classified as "non-oral" in 1974. The score of 97% correct for Program G students represented the highest single score for any program on any subtest, and Program F's 89% also suggested a high level of functioning. Both are above the overall mean score obtained for sound and speechreading signs.

The final addition, signs, represented the most efficient overall mode at 88% correct, with no program, even Programs B and D, scoring below 80%.

Scores on the understanding of passives, negatives, and verb tenses suggest that deaf students tend to process all sentences as simple, active declaratives, ignoring indications of tense, mood, and negation, regardless of the mode of communication; the exception found was that performance is better on printed material.

4. *Expressive Communication.* Consistent with their superiority on the sound alone receptive test, pupils on Programs B and G scored highest in articulation of one- and two-syllable words with no context. However, when rated on spontaneous description and story telling across three groups of raters (hearing graduate students, interpreters for the deaf, deaf adults), their scores fell below the overall average.

Table 4

Correct Responses on Receptive Communication Scale (Core Items) by Program and Mode of Communication, in Percentages

Program	*N*	Printed Word %	Sound Alone %	Sound & Speech-reading %	Sound & SR & Finger-spelling %	Sound & SR & Signs %	Total Correct %
A	6	90	40	53	77	83	68
B	12	67	40	65	51	80	63
C	8	77	37	65	75	93	69
D	13	65	58	67	55	85	64
E	7	80	34	51	80	94	68
F	8	90	35	83	89	—	75
G	6	77	53	90	97	93	82
Total *N*		60	60	60	48	40	60
$\bar{X}$		76	44	68	75	88	69
SD		29	27	31	28	21	19

Source: D. F. Moores, K. L. Weiss, & M. W. Goodwin. *Evaluation of programs for hearing impaired children.* University of Minnesota Research, Development and Demonstration Center in Education of Handicapped Children. Research Report #81, December 1974, p. 63.

For all programs, the most efficient raters were interpreters (56.66%) followed by deaf adults (31.41%) and graduate students (19.54%).

In view of the relatively high performance of Program F subjects in receptive communication, reading, and arithmetic, their low expressive scores seem inconsistent. It may be that the Rochester Method provides excellent means for receptive communication for a young child but places limitations on expressive effectiveness.

5. *Cognitive Development.* Tests of Classification, Conservation, and Seriation revealed no differences among programs in 1974 on any of the measures. Previous differences in favor of a "Piagetian" preschool (Program F) disappeared, suggesting that the activities themselves had no lasting effect on cognitive development, as measured on academic achievement, receptive communication, and experience communication.

6. *Communication Patterns.* Classroom observation consistently revealed that the least communication occurred in oral-aural classes and the most in total communication classes. Teachers and children in oral-aural classes, to a large extent, relied on gestures, apparently unconsciously, so that one program properly could be classified as oral-gestural. Similar discrepancies were found in some "total communication" classes where only a small proportion of the spoken words were signed. This finding was especially evident in programs that recently had switched methodology.

7. *Parent Attitude.* At the beginning of the evaluation, parents of children in Oral-Aural programs saw the goals of early intervention as the development of speech and speechreading skills, whereas parents of children in combined Oral-Manual programs placed greater emphasis on academic skills, such as reading and math. By 1974, the attitudes of parents in the Oral-Aural programs had changed, essentially to the same as those of parents of children in combined programs.

Discussion.

The results of the longitudinal evaluation suggest that issues related to early intervention programs for the hearing impaired are far more complex than has been assumed by most educators. Although, in general, the programs involved in the evaluation have been more successful than those involved in previous studies in facilitating communicative, cognitive, and academic growth, each program exhibits a unique pattern of strengths and weaknesses. At present, the development of guidelines for early intervention programs, based on the findings of the longitudinal evaluation, is one of my major concerns.

Summary

In the field of education of the deaf, the most important recent advances have come from medicine, primarily in the near elimination of post-lingual hearing loss in children, and from technology, in the form of improved hearing aids and increasingly sophisticated audiovisual hardware. Only education, the final component of the triad, has failed to make any substantial new contribution. Educators of hearing handicapped children, long given to inbreeding, traditionally have been isolated from the main body of education and child development and, therefore, have not benefited adequately from improvements in general education. The burden now is on educators to contribute their share.

Although the tiresome oral-manual controversy has taken on different dimensions, it still remains one of the critical issues in dealing with young hearing-impaired children. In addition, educators must exercise great care and judgment before solidifying positions on questions such as unimodal and bimodal presentation, and on the relative

efficacy of social, cognitive, and academic emphasis in preschool programs. For years, lip service has been paid to the concept of individual needs and individualization of instruction. If the ideal, or the pursuit of the ideal, becomes a reality in the near future, such either-or dichotomies and trichotomies will become meaningless and we will actually approach our goal: fitting the method to the child rather than vice versa.

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Nolan draws attention to some of the major limitations that blindness imposes on the individual and suggests some specific procedures for assisting the blind child to compensate for them. It should be pointed out that such procedures readily can be included in regular preschool programs for seeing children. It is for this reason that studies consistently show that blind children benefit as much from programs in which they are placed with sighted preschoolers as from those in which they are placed with other blind children.

It is well documented that the distorted attitudes of the public toward blindness (especially the belief that blind persons are unable to care for themselves without the help of sighted persons) are often more of a handicap to blind children than the blindness itself. Perhaps providing sighted children with the opportunity to interact with blind children will eventually dispel such distorted stereotypes.

The impact of the rubella epidemic of 1964-65 did much to refocus attention on the education of deaf and blind children. Their education has become a national concern. Nolan, with his rich background as an experimental and personnel psychologist, brings to this problem both a research and teacher-training perspective. His suggestions for teachers are based on a long series of research studies on the effectiveness of curriculum materials for partially sighted and blind students.

Implications from Education of the Visually Handicapped for Early Childhood Education

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The early childhood development of visually impaired children can differ both qualitatively and quantitatively from that of normal children. Quantitative differences arise as a consequence of possible disparities in the rate of development which may be imposed by the handicap or its associated factors (Fraiberg, Smith, & Adelson, 1969; Lowenfeld, 1971; Scholl, 1973). Qualitative differences arise as a consequence of denial to the visually handicapped of certain opportunities for experience and of differential emphasis on touch and hearing as sensory channels. Educational efforts to overcome these differences have implications for the early childhood education of blind, other handicapped, and normal children.

Lowenfeld (1962) succinctly described the restrictions imposed upon the individual by blindness as in the (a) range and variety of experience, (b) ability to get about, and (c) control of the environment and of the self in relation to it. Although many visually handicapped children have useful residual vision, these restrictions still apply in part. The effects of these restrictions are as follows:

1. Persons with severe visual impairments must build up their conception of the world through the use of their remaining senses, that is, touch, audition, and kinesthesis. Hearing, which provides certain clues with respect to direction and distances, provides very few concrete ideas of object quality. One learns little about the shape, color, and size of a bird from its song. The perception of spatial objects can be achieved only by touch and kinesthesis. But tactual spans are severely restricted and large objects can be inspected only sequentially. Many phenomena are of a size that prohibits tactual inspection; many others are not available to tactual inspection because of physical inaccessibility (clouds), smallness in size (ants), fragility (soap bubbles), or motion; and many are dangerous to inspect tactually.

2. The inability to get about prevents the individual from voluntarily changing his environment to experience the varieties of opportunities for observation and activity that are open to the sighted person. Thus, blind persons are limited from infancy in their ability to expose themselves to both environmental and social experiences. Access to such experiences is largely dependent upon assistance from others, which affects blind persons' social relationships and attitudes, consequently.

3. The inability to control the environment and the self in relation to it, though less obvious, is all-pervasive and often subtle in its effects. Vision is the sense that allows, at a distance, the opportunity to determine object qualities and acquire information about

the relations of form, size, and position. Vision allows one to orient oneself to the environment while remaining stationary. In the social sphere, vision allows opportunity for a wide variety of nonverbal communication through facial expressions or bodily gestures. Thus, the lack of vision causes a detachment from the physical and, to a lesser extent, the social world.

Despite these difficulties, a major premise of most specialists who deal with visually handicapped children is that the developmental and educational goals for them should be identical with those for normal children. It is recognized that ordinary educational techniques and media may be inadequate for goal attainment and that special efforts in educational systems development may be necessary. Nolan (1969) described the ideal in the following terms:

> The ultimate goal. . . should be the development of educational systems for the visually handicapped. Briefly stated, this approach requires description in detail of the learning tasks imposed by the school goals or curriculum, description in detail of the capabilities of visually handicapped students for attempting these tasks through the fullest use of the capabilities they possess. . . these necessary interventions include educational media, education techniques for learning and teaching, and the means of assessing task mastery. (p. 242)

This conception can be extended into the preschool years.

More than a decade ago, Lowenfeld (1962), drawing in an eclectic fashion from educational practices spanning two centuries, identified and described five principles that seem basic to the teaching of visually handicapped children.

1. The principle of individualization states that programing for each child should be based on his individual needs as determined by such factors as degree of visual defect, cause of blindness, age of onset of handicap, current eye condition and required eye care, and home environment, as well as those factors commonly considered in all educational programing. The objective of this principle is to avoid programing based on a generalized concept of blindness.

2. The principle of concreteness stresses the importance of direct experiences in the developmental and educative processes. Naming things to the blind child and describing their physical or other attributes is not an adequate way to teach him about them. He needs direct and immediate experience with objects in order to attain concepts of them which are valid in terms of his own sensory capacities. For example, the concept of a dog, acquired through a verbal description and through listening to its bark is not the same as the concept which is augmented by actual tactual inspection and manipulation of a stuffed dog. In turn, that concept is less real than that obtained through tactual inspection of a live dog. Only through emphasis on immediate experience can we diminish the probability that the child's conceptual world will be overburdened with verbal unrealities.

3. The principle of unified instruction is directed against departmentalization in the child's acquisition of knowledge. The visually impaired child is at a great disadvantage in experiencing objects and situations in their totality. Vision is the sense through which we can scan the environment in detail and interrelate its parts into a visualized conceptual whole. At the same time, we can correlate visual information with that obtained through our other senses and associate causes with effects. Without vision's unifying effects, the blind child may not realize that the sound he hears, the odor he smells, the form he feels all may emanate from the same source. He

will fail to realize that the breeze he feels on his cheek is also moving trees, clouds, and other objects in the environment. His conceptualization of a supermarket may consist merely of a series of noises, smells, and tactile-kinesthetic impressions organized sequentially in a time frame. In order for the child to gain organized, interrelated concepts of his environment, instruction must be especially designed so that he experiences given situations as wholes or units.

4. The principle of added stimulation is essential as a consequence of the blind child's limited mobility. As compared to the sighted child, the blind child's field of exploration is extremely confined. The parents or teachers of visually handicapped children must widen each child's field of experience by either taking the child to the experience or bringing the experience to her/him. Regardless of the route elected, much preparation is required to maximize the returns from such efforts. Field trips or imported demonstrations must be thoroughly reconnoitered. Parents or teachers must analyze environments in terms of the sound, smell, and touch qualities through which they can become known to their children. Blind children who have limited opportunity for outside excursions and contacts can benefit from every phase of a project if their need for additional stimulation is kept clearly in mind and time and energy are channeled to meet this need.

5. The principle of self-activity implies that the blind child should be taught to do as many things for himself as his capabilities and available time allow. Teaching is necessary for the most commonplace activities. Because of his lack of sight, the child is unable to observe and imitate others. Consequently, many activities beginning with those as simple as locomotion and extending to those as complex as social interaction must be taught directly to blind children.

These principles may become more meaningful if they are illustrated by the solutions of actual developmental problems experienced by the visually handicapped. Problems from the areas of language, motor, social-emotional, and cognitive-perceptual development are considered as well as academic problems. Finally, the principle of unified instruction is illustrated.

In the case of oral language development, Lowenfeld (1971) described the difficulty severely visually impaired children may experience in connecting words with their objects. For example, a blind child may come to know through listening

> that people can tell time by looking at the clock on the wall. To a seeing child, the clock with its face and two hands is a very familiar object. To the blind child, it will remain a word without real content unless he is shown the clock (individualization) and its parts are explained to him (concreteness). (p. 67)

Kurzhals described efforts to develop the ideas that reading is (a) talk written down and (b) the description of familiar objects. This effort represents a concrete approach to the overcoming of developmental deficits that arise from lack of relevant experience with books prior to school entry. In (a) the approach is individualized and self-activated by writing out stories the child tells about his own experiences and putting them into the form of braille books. In (b)

> books made of such things as beads, buttons, buckles, balls of cotton, ribbon, and various kinds of pins fastened to heavy cardboard are introduced. The child looks at the object and finds immediately below the object Braille words which tell about that at which he just looked. (Kurzhals, 1966, p. 107)

Thus the child learns he can read what he says and that words can tell about objects that are familiar to him.

Examples of developmental problems in the motor areas are abundant. Two examples from infant development are revealing. A major problem in the development of very young visually impaired children is that they lack the stimulation to activity normally arising from the sight of attractive objects in the environment. Fraiberg et al. (1969) pointed out the delay in reaching behavior imposed on the infant by the necessity for prior development of hand-ear coordination. Active provision of a variety of sound stimuli within the crib and elsewhere to enhance this development was described by Lowenfeld (1971); it is, of course, concrete, individualized, self-activating instruction. Development of creeping by blind infants is dependent on prior development of hand-ear coordination. Fraiberg et al. (1969) stated,

> When a baby can demonstrate readiness for creeping and reach on sound cue alone, one can initiate the pattern for creeping by providing him with a favorite sound toy just beyond his reach. (p. 135)

Lack of vision impedes imitation. Inability to imitate may delay the acquisition of such rudimentary motor skills as chewing. The parent may have to provide individualized, concrete experience that stimulates self-activity. As Bryan (Note 2) stated, "Most babies naturally put things in their mouths . . . and automatically learn about chewing. If this does not happen with your child, . . . place his hands on your cheeks as you chew" (p. 13). Halliday (1970) described the steps necessary to teach stair climbing.

> At first another person might go up a step or two beside him, encouraging and helping him explore and understand what is happening through the repeating of actions. Later, coming down can be done in the same fashion with only a few steps involved initially. The youngster's foot use may be helped if his feet are placed one at a time on the step, with hand position adjusted on the railing. (p. 30)

In the social-emotional area, both Fraiberg et al. (1969) and Lowenfeld pointed out the need for the mother to purposely talk to her infant to replace the visual contact ordinarily open to the sighted infant and its mother. This application of the principle of added stimulation is important to the infant's emotional security.

> If your child cannot see you smiling, he needs to become more aware of your love and interest in him by your talking to him. . . . He will soon know that the words with which you can accompany the things you do for him are spoken as the loving accompaniment of actions which are pleasant to him, just as (sighted) children quickly learn that a smile means approving friendliness. (Lowenfeld, 1971, p. 22)

The blind child must be explicitly guided into sociability.

> Much desire to get acquainted with others, to be with others, to play with others develops from one's observing the personal and social activities of others . . . .The visually impaired child has to learn, first, how to be aware of the presence of another person. Bringing him "in touch" with other children and telling him about them will give him a good start. Useful thoughts in this area concern the value of the child's learning to shake hands, and to turn

his head in the direction of those with whom there is contact. (Halliday, 1970, p. 62)

In the cognitive-perceptual area, Barraga (1964) demonstrated that individual analysis of low-vision children's level of visual functioning followed by individualized programs of unified instruction emphasizing added stimulation, can result in increased levels of useful vision. This research has been replicated over a wide range of chronological age. In the area of listening, Nolan and Morris (1969) showed that causing visually impaired children to increase their levels of self-activity through mental review or note taking can result in significant increases in the amount of material recalled.

Applications of Lowenfeld's principles in the general education area can be demonstrated. Retardation in arithmetic achievement (Nolan, 1959) has long been a problem of the visually impaired. However, it has been demonstrated that providing concrete means for learning computation with its accompanying self-activization in the computational process can lead to increase in achievement (Brothers, Note 1; Nolan & Bruce, 1962; Nolan & Morris, 1964).

Individualizing instruction, making instruction and experiences concrete, providing added stimulation, and increasing self-activity often add to the total time required for instruction. This reason alone emphasizes the necessity for unified programs of instruction with their accompanying increase of efficiency. However, following this principle also helps tie concepts together on a broad basis. The following summarized lesson plan exemplifies unified instruction. It is taken from a developmental readiness program recently published by Kurzhals (1974).

Environmental Experiences: Food

The object of the lesson is to teach children about food through environmental experience, that is, a visit to a vegetable garden. However, as planned, the visit is an integrated experience focused on developing understanding of the physical environment, oral language skills, skills in listening and following directions, tactual and manipulative skills, beginning mobility concepts, and ability to think and make decisions.

The children are motivated for the trip by active participation in the planning, learning songs about food, and discussing vegetables: the different ones they eat, how they are planted and grown, and where vegetable gardens may be found and how they can be reached. Additional interest is engendered by speculations on the potential side experiences of the trip.

During the actual trip to the garden, previous ideas about vegetables and their growth are reviewed. Preparation of vegetables for eating is discussed, and the children identify which may be eaten raw and which must be cooked. Once there, the children walk up and down the rows. They discuss how things can be arranged in rows and how long the rows are. Children identify vegetables through tactual exploration of size and shape. Vegetables are actually picked, pulled, or dug up by the children. The vegetables are compared physically and they are categorized, placed in containers, and counted. Factors such as size, shape, texture, and color are described and discussed. The children can compare their own statures with the size of plants like corn.

On the return trip, each child recounts what he was able to do, relates what he experienced to the original plan he made, and describes what he liked best and what he learned that was new. Once back in the classroom, the child orally reviews his experience. This review may be recorded or written down for later class presentation. The children can compare the vegetables they have brought back for likeness and dif-

ferences. Real vegetables can be compared to plastic or other models and the likenesses and differences discussed. The children should prepare some of the vegetables for eating. Tastes and textures of raw and cooked portions can be experienced among the same and different vegetables.

Through such coordinated experiences, the objectives mentioned at the beginning of the lesson can be attained. The critical element is identifying, integrating, and maximizing the learning aspects inherent in the total experience.

Conclusion

The general principles of designating successful management techniques to enhance the early development of visually handicapped children may be briefly described as follows: The passive must be made active, the implicit made explicit, the abstract made concrete, and the vicarious made real; all with emphasis on the needs of each child.

With respect to the application of these practices to the early childhood education of other handicapped and normal children, it may be useful to explore some of them as means of facilitation. However, to the extent that they serve as substitutes or adjuncts to capacities in other children that are, in fact, superior, or more efficient than those possessed by visually impaired children, their application may only serve to unnecessarily retard or complicate. Practices defined and initiated to enhance the development of visually handicapped children indeed may find positive application in the case of children whose difficulties interfere with direct environmental contact or restrict the extent of their interactions with the environment. This latter group would include children affected by most of the handicapping conditions falling under the special education umbrella.

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The establishment of funds for preschool programs for handicapped children (HCEEP) has done much to stimulate development centers for preschool children. These programs serve infants, toddlers, and 2-8 year olds who have a variety of handicapping and multihandicapping conditions. Jane De Weerd, project officer for the Bureau for the Education of the Handicapped reports that there are now over 150 funded programs funded through the Act. Many new programs focus on the behaviorally disordered child. In the past, intervention programs for socially and emotionally disturbed children were extremely rare and, although the number has increased, it is still inadequate to meet the national need.

In this chapter, Garfunkel discusses some of the earlier programs. His major contribution, however, is a discussion of the problems and issues which should be considered in providing services for disturbed preschool children: locating children, avoiding labeling, educating parents, and training teachers. He brings to the chapter his rich experience in working with young handicapped children.

Garfunkel's chapter with Barton and Blatt on "Teaching the Mentally Retarded" is one of the more notable contributions in the field. This chapter, which is based on his extensive experience, provides guidelines for the establishment of new programs.

Early Childhood Special Education for Children with Social and Emotional Disturbances

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Emotional disturbance in early childhood is a deceptive disability in much the same way that mental retardation has been and continues to be. For example, in studies of and demonstration programs for preschool mentally retarded children over the last two decades, investigators have reported considerable difficulty in locating psychometrically subnormal preschool children (Blatt & Garfunkel, 1968; Fouracre, Connor, & Goldberg, 1962; Kirk, 1958); and where such samples have been located (Weikart, 1964), it has become clear that much of what we know as intellectual disability is closely related to the expectations and practices of schools and, therefore, is not readily apparent in pre- and post-school age groups (Mercer, 1973; Robinson & Robinson, 1965; Sarson & Doris, 1969). There are several explanations for this more-or-less accepted finding: Much retardation (except for that associated with central nervous system impairment) is developmentally age linked and does not occur until school age; retardation cannot be measured at early ages; or retardation is not solely within the child but is school specific, a result of interaction with a school environment. Many preschool projects of recent years have assumed that although intellectual disability is potentially there, possibly as an interaction phenomenon, it is difficult to detect in individuals. One possible strategy is to locate groups from populations in which school-age retardation and disturbance are most likely to occur (Blatt & Garfunkel, 1968).

The problems of detecting and treating mild-to-moderate emotional disturbance in preschool children appear to be similar. Up until the present time, such children have been largely ignored. Children with a variety of disabilities, which would be handicapping in any high-demand situation, such as school, can get by at home and in preschools where excessive demands are not made on them and the forms and content of activities are determined more by child preferences than curricular plans. Disability can be supported (and made invisible) by the routines and structures of the relatively confined lives of young children. A preschool that makes few demands on children is unlikely to contribute to the surfacing of extremely disturbed behavior.

Surveys, clinical and experimental studies, and treatment programs of and for preschool children (ages 2-6) have almost exclusively focused on highly specific clinical subgroups (Alpert, 1955; Hingtgen & Bryson, 1974; Rexford, 1949). The more generalized problem of prevention has received little attention, despite general acceptance of the assumption that disability is best prevented and treated when it is discovered as early as possible (Richmond & Lipton, 1961). System or statewide programmatic attention to early childhood disability is rare,

with a few notable exceptions in retardation (Bindman & Klebanoff, 1959), but almost without exception in disturbance, except for many demonstration-type projects that seem to end before they begin. Until very recently, Head Start and school system and statewide kindergarten programs have not included provisions for disabled children and, consequently, have generally excluded them. The 1972 amendments to the Economic Opportunity Act mandated that not less than 10% of the Head Start enrollment nationwide be made available to eligible handicapped children (LaVor, 1972). There continue to be grave obstacles in identifying and treating young children with serious disabilities (Ensher, Blatt & Winschel, Note 1: Nazzaro, 1974). Massachusetts has legislated local school system responsibility for handicapped children from ages 3-21 (Massachusetts Acts of 1972, Chapter 766). But here too implementation is moving very slowly, as revealed by the statewide monitoring by public interest advocacy groups (Mass. Advocacy Center, 1975). It is ironic that children most in need of educational intervention are excluded, while those who are functioning at fairly high levels and have less pressing needs are included.

The availability of free public kindergarten programs is a relatively recent phenomenon in American education. However, the programs have developed in a highly selective manner. Wealthy suburban communities have led the way, and lower income communities have been the last affected. With few exceptions, there are no public school kindergarten programs in the Deep South, and in most poor inner-city areas, only a fraction of age-eligible children are enrolled (Kerkhoff, 1965). Since school attendance is generally not compulsory until the age of 7, schools can and do exclude disabled children freely, with the recommendation that they come back in a year or two (Task Force on Children out of School, 1971).

In light of this situation, it is not surprising that knowledge about disturbances of preschool children is highly specialized and, therefore, probably distorted. A considerable amount of work has been done with middle-class, preschool, psychotic children who happen to show behavior that is "interesting" to particular clinics or researchers. Each of these clinics freely excludes children who do not fit into its categories--categories that are concerned not only with the child's behavior (autistic, atypical, antisocial, neurotic) but implicitly with the parents' behavior as well (bring the child in twice a week, talk to a social worker once a week, keep appointments).

This brief historical and current status survey is not meant to condemn what has been done; these clinics have pioneered in service, training, and research. But it is necessary to know where we are in order to plan research and service strategies and to extend our knowledge and service potential. Continuation of current treatment practices may serve to improve skills in dealing with highly restricted groups of middle-class children, but it will neither extend our knowledge about behavior nor confront us with the pervasive mental health problems of young children from all social classes. Similarly, the use of models derived from data which were obtained from special groups of children and methods are of dubious value in generalizing about incidence, diagnosis, and treatment.

Albee's (1969) polemical critique of psychiatric clinics can be applied to schools and agencies that take care of and educate preschool children:

> They are treating the wrong people; they are using the wrong methods; they are located in the wrong places; they are improperly staffed and administered; and they require vast and widespread overhaul if they are to continue to exist as a viable institution. (p.4)

In reply, Schacter (1969) argued that much of what psychiatry

(education) has to offer is only for middle-class consumers. The little data available make it clear that children and adults from lower social classes are practically untouched by mental health resources (Ryan, 1969), including psychiatry. This situation is also evidenced by state mental hospitals and state institutions for the retarded--they are largely inhabited by individuals from lower social classes. It can be argued that not only services and agencies but roles and languages have emerged from training, practice, and theory which are of dubious value for the study and treatment of disturbances of children from lower income homes, particularly those of ethnic and racial minorities (Smith & Greenberg, 1975).

In short, the success with which a problem is studied will depend partly on whether it has been effectively and operationally defined. If personnel and procedures for identifying and treating disabled children exist in a school system, then one can raise research questions (knowing full well that research methododology and results will be much affected by those same personnel and procedures) about who the children are and how they are being treated. If no such services or personnel exist, as is presently the case, then initial research and instructional questions will revolve around processes of identification. If identification requires extended involvement--observation, screening, follow-up, testing, referral--which appears to be the case, it can be done only by personnel partially or wholly within the system. But if the personnel and parents within that system have little feeling for and knowledge about broad concepts of emotional disturbance that transcend social class and particular diagnostic groups, they will resist recognizing the problem and will balk at raising questions about existing services.

To Label or to Ignore: The Dilemma of Early Childhood Disturbance

Over the past 10 years, my associates and I have been deeply involved in programs of research, service, and training that focus on the problems and needs of preschool children (Blatt & Garfunkel, 1968; Garfunkel, 1970a; 1970b). During this time, it has become increasingly clear that the fields of early childhood education and special education have been attempting to look at each other in mirrors while they were being led to believe that they were looking through windows. Preschool educators and researchers have developed programs and studies as if serious emotional and social disturbance did not exist, but special educators, including psychiatrists and psychologists involved in educational programs, have participated in programs and studies that would make it appear that severe disturbance was the only kind that was noteworthy. Both views serve to generate a concept of early childhood disturbance that makes it seem to be a categorical disease entity with miniscule incidence, not unlike the views prevailing about mental retardation 20 to 30 years ago.

A small number of relatively well-known centers serve children diagnosed as autistic, atypical, schizophrenic, or childhood psychotic. The children form a highly restricted population that displays extremely bizarre cognitive, social, and linguistic behaviors. Relatively few centers, classes, or schools are found for mildly to moderately disturbed preschool children (U.S. Office of Education, 1969). The questions of whether such children exist in any considerable number and, if so, whether they need special services, are open and unstudied. Certainly a great deal of resistance is shown by teachers and parents to designating any preschool child as emotionally or socially disturbed, for a variety of good and bad reasons. It is felt that premature labeling may contribute to a chain of events that would further reinforce the disturbance (Mercer, 1973); parents may strongly resist the

idea that their children are disturbed and, therefore, they disdain the the use of labels and the conditions they imply. In many cases, the failure to designate and accept a label can prevent more extensive diagnosis and consequent services. It is well known that prevalence figures for mental retardation and emotional disturbance quadruple at school entrance and diminish, similarly, at school-exit age (Hobbs, 1975; Sarason & Doris,1969). Since much of what we know as intellectual and emotional disability is school specific, it is no wonder that these disabilities are only minimally recognized at preschool ages.

There are many ways to view this current state of affairs. Certainly there are good reasons to be skeptical of institutions and special classes and the segregation that goes along with them (Blatt, 1970). Studies of the efficacy of special classes provide little supporting evidence for them. Most tend to give equal credence to placing disabled children in regular classes (Blatt & Garfunkel, 1973; Goldstein, Moss, & Jordan, Note 2; Guskin & Spicker, 1968; Kirk, 1964). Similarly, the existence of large and small and state and private institutions throughout the country has little to recommend them as a strategy of choice for the care, education, and training of individuals with social, emotion, and intellectual disabilities (White & Wolfensberger, 1969).

It does not necessarily follow that labeling must lead to special classes and institutions or to isolation and the perpetuation of the labeled condition. Nor does it follow that the identification of disability, including its designation, needs to be accompanied by an inept, prophesy-fulfilling diagnostic process, as often appears to have been the case in the field of mental retardation. While risks are manifest, it can be argued that the greater danger is in ignoring and denying the continuity and dimensions of disabilities and of being unaware of their implications for programing. Mildly to moderately disturbed preschool children are often excluded from both private and public services. Their problems, consequently, are being ignored and not recognized until well after the minimal age for school entrance (Task Force on Children out of School, 1971).

Sampling Problems

The fact that public and private preschools either directly or implicitly exclude children with disturbances has tended to further obscure the problem. Moreover, the tendency of preschool teachers to develop low-demand classroom situations in which children with even quite severe disturbances can get along without attracting clinical and special educational attention contributes to the difficulty of accumulating reliable data to support labeling. For example, when we developed a mental health clinic for a Head Start program with 150 children, we got few referrals from teachers the first six months (Garfunkel, 1970a). A year later, after extensive work with teachers and parents, we had a continuing case load of 30-40 children from this program. The identification of the children in need of special educational services was only possible after an extensive observational training program that made teachers and parents more discriminating about children's behaviors.

Diverse strategies were used with the identified children, including remaining in regular classes with special educational support; switching to other regular classes and away from aggravating situations; transferring to a special class; and clinical intervention with families with and without special class placement. Furhtermore, it became more apparent that without the clinic, at least half of the cases would not have remained in the educational program and a considerable part of that subsample would not even have been located in the first

place. When we (the university research center) departed, the Head Start Center dropped the program, and young children with severe emotional, social, and cognitive disabilities were no longer served.

The title dilemma--to label or to ignore--is not easily resolvable. We must risk the dangers of labeling because the exclusion and denial that go with nonlabeling are dangerous to both the children who need special services and other children who need to be in programs that can openly deal with disturbances of all kinds and degrees. This bias is not based on the conviction that special services and programs will eventually make children healthier or that connections can be established between childhood, latency age, and adolescent and adult disturbance. Research on both of these propositions is discouraging. Follow-up studies of children in different kinds of special educational and therapy programs tend to support the familiar result: Whether children are in special programs, and no matter what kind of special program it may be, one-third improve, one-third stay the same, and one-third get worse. This outcome can be attributed to methodological, sampling, or criteria problems, or to the general deficiencies of social science. In any case, it would be presumptuous and misleading to think of eventual outcome as the principal factor in generating special programs.

Similarly, studies that attempt to prove the continuity of emotional disturbance--that disturbed children are more likely to become disturbed adolescents and adults, or that disturbed adults were more likely to have been disturbed children or adolescents--do not hold up (Lewis, 1965; Rutter, 1974). Again, a host of research problems may invalidate the findings (or, rather, the lack of findings) instead of the proposition of continuity. However, the lack of findings is a counterindication to basing identification and programing efforts on the assumption that unless we provide special services, children who show serious disturbance will become disturbed adolescents and then, in time, disturbed adults.

Classification and Labeling

Closely connected with problems of identification are those of classification. The taxonomy of childhood disturbance is in an extremely tenuous state, even when it is used in connection with extensive diagnostic resources. Some colleagues and I recently surveyed 150 clinics, schools, and other types of agencies that service emotionally disturbed children and adolescents (Garfunkel, in press). Among other questions, we asked about children served and services and personnel available, in order to ascertain the consistent use of labels and some relation between types of disturbance, severity of disturbance, and services available. We could find no consistent relation across clinics, centers, schools, and institutions. We questioned whether our finding represented a chaotic situation or reflected the primitive state of knowledge in this field. In either case, it is not very encouraging because there appears to be very little on which to build a taxonomic structure that would be useful for identifying children and developing treatment programs, analytic models notwithstanding.

If we recognize that there are children whose lives are often painful to them and others and who need special services to get along now, we can put off dealing with negative follow-up, continuity, and taxonomic findings and focus our attention on current child and family behaviors. It has been argued earlier that the failure to identify and deal with special needs leads to the exclusion of children from programs or to nonproductive inclusion. Theoretically, this failure leads to behavioral and therapeutic models based on incomplete data. As long as theories of disturbance come from clinicians who work with

highly restricted samples of children, we can expect corresponding distortions in theory and inferences about relations between disturbances and various interventional possibilities. But samples will be restricted until administrative procedures recognize the very definite and biased ways in which samples are selected. To constructively include mildly and moderately disturbed children into programs means developing a language to describe their behaviors and to summarize those descriptions--in other words, labels.

I must restate the implications for early childhood education: Without intense formal efforts to identify deviant behavior, the system will, necessarily, view the behaviors of every child in a distorted manner. Every child behaves deviantly from time to time and has the possiblity of behaving deviantly more often, to an extent that he will need special services. The recognition of endemic and pathological deviancy and the states in between is necessary for preventative mental health. It is necessary for participants to be educated to the full range of deviant possibilities if they are to deal with any part of that range, including normal behavioral variations. Furthermore, the line between deviancy and creativity is thin and erratic. It demands sustained attention, lest unwittingly we be controlled by data from highly biased sources, which will endanger the development of both theory and practices.

The development of a useful taxonomy for classifying childhood disabilities, which could facilitate the process of identification and the development of services, will depend on a considerable amount of work with teachers. The fragmented nonsystem that presently exists is largely a psychoanalytic inheritance which is used to indicate the past (etiology), the present (symptoms), and the future (prognosis), as well as sometimes (rarely) implying what should be done (treatment plan) or where a child should be placed (administration). Most categories currently in use consist of fragments of each part of the chronology or disability. Some fragments are explicit while others imply what might have happened or what might happen at some future time. For most labels, the innuendo about future prospects dominates any etiological or symptomatic facts. Terms are used to label children with very little consideration for the important distinctions among them (Engel, 1969). Often, medical-neurological terms such as "brain injured" are freely appropriated to psychoeducational behavior in such a way as to completely lose sight of physiological meaning.

The point here is that there is no workable descriptive-diagnostic system that can be freely and constructively shared with teachers so that degrees and kinds of disturbance (and other disabilities) can be more readily identified and serviced. Such a system will probably have to be evoked from a collaboration between special educators who are sensitive to disability and regular class teachers who are more sensitive to normal behavioral variations. It will also depend on greater awareness of the relation between disability categories and effective interventions. Since teachers are the most sustained and immediate observers of interventions, it is probable that such connections between categories and interventions will not be inferred without the continuous involvement of teachers.

Situational Variability as the Link between Identification and Programing

Several years ago, my associates and I had the opportunity to study early childhood disturbance in a rather unique way (Garfunkel, 1970b). Through the cooperation of the teachers, parents, and administrators of a local Head Start program, we were able to assign 140 children randomly to seven Head Start classes. In addition, we were

able to select the 7 teachers for these classes from a pool of 17 candidates, most of whom had had at least 3 years' experience. Our purpose was to determine whether disturbing behaviors, from which emotional disturbance is inferred, were more prevalent in some classes than others. Put in another way, we wanted to find out if disturbing behaviors were a function of what children brought to their classes or of what happened to them in the classrooms with their teachers and peers. If the first was a better explanation, then we expected a more or less equal distribution of disruptive incidents in the seven classrooms. To insure the likelihood of finding out, the randomization was stratified on family and personal history variables. Children with any history of disturbance were distributed throughout the classes. Stratification also covered tested intelligence, sex, and race.

If disturbance were more a function of an evolving environment, then different qualities and quantities of disturbance from the respective classes as a function of teacher variation could be expected. To maximize this possibility, we selected, after extensive interviews, seven experienced teachers who had totally different expressed orientations toward teaching.

We observed these classes continuously and systematically throughout the year. A team of seven observers rotated from class to class during the first week for complete coverage. Data collection was aimed at recording the frequency and description of disrupting incidents in the seven classes, with particular attention to how these incidents were dealt with by the respective teachers.

Our results were unequivocal. Disturbance was categorically a function of classroom environment: 75% of disturbing incidents came from 2 of the classes and 25% from the other 5; disturbing incidents were approximately 9 times more frequent in the high-prevalence classes than in the low. This finding applied equally to various categories of disturbance and degrees of severity.

There was no simple way to differentiate the two high-prevalence classrooms from the other five. (For a careful description of how the teachers in two of the most divergent classes provoked and avoided disturbances, and how they dealt with them, see Keane, Note 3.) One of the two ran a very permissive, open classroom with minimal structure and maximal informality. The other ran a carefully planned, more or less formal class. Both styles were found in the low-prevalence classes. The failure of conventional stylistic distinctions to relate to important behavioral variables reinforced our bias about their irrelevance, as opposed to the importance of more subtle interpersonal variables. We can no more relate style of functioning to behavioral disruptions in classes than we can relate political and social values to individual disturbance.

At any rate, class environment appeared to be a crucial determiner of the existence and continuation of disturbance in individuals and subgroups within these classes. Our analyses of qualitative data did not lead to the further conclusion that the existence or absence of disturbance was good or bad in and of itself. Rather, we inferred that classrooms that encourage disturbance, as shown by its continued presence, necessarily have different goals than classrooms that discourage disturbance.

Our many discussions with the teachers, however, revealed that they viewed disturbance as coming from individuals and groups of children, rather than as resulting from an evolving environment that was particularly related to and an expression of a teacher's personal style. Similarly, teachers in classrooms with very little disturbance described their children as being "good, well-behaved, no trouble," despite their awareness that we had randomized the children in such a way as to make the classes maximally similar. This view of distur-

bance persisted despite several rather extreme disruptions in the classrooms, and it resulted in considerable resistance to shifting children from one class to another. Our finding is consistent with our observations of many classes and schools, and it applies to both academic and social-emotional functioning. Teachers, psychologists, and parents will readily admit that children (and themselves) behave differently from situation to situation; however, most of our educational structures and practices are planned and carried out as if individual behavior were relatively invariant from situation to situation and from time to time (Krouse, 1970). Our study of classroom disturbances brought this paradox into very specific relief.

We certainly need more data on situational determinants of disturbance and successful treatment (Moos, 1974). The need is critical if early childhood education is going to deal with disturbance more directly. Labels and diagnostic processes must accurately reflect the distinction between individual and situational determinants. But this distinction will depend on how children are selected, and by whom, where, and under what conditions they are taught. Narrowly conceived programs that perpetuate conventional models will not contribute to our insights about behavior-situation variance. More specifically, sampling, situation, and role restraints, whether intentional or otherwise, will increase the possibility of distortions, probably more than limited observational or research opportunities. Teachers and psychologists who teach and study samples of children with restricted ranges of behavior and excessive homogeneity (age, sex, race, socio-economic status, ethnicity) will be limited in the ability to gain insights about situational variation. The questions is not simply one of research in which we can assume that if data are collected correctly, the resulting inferences will be acceptable. Situations and children have to be constructed and selected in such a way as to make situational comparisons inevitable. Such procedures will not resolve the problem of designation--who is disturbed?--but they will move us in the direction of being able to designate without condemning. Thus, disturbances can be identified and treated rather than ignored.

As we try to develop a more useful system for classifying early childhood disturbances by developing the concept of situational variation, it must be remembered that if a set of labels bears little relation to available services, its use will minimize the possibility of individual children's and families' receiving those services. Because no services may exist for certain categories, particular labels may exclude children from getting services through regular channels. For example, if a child is labeled mentally retarded and classes are inadequate or nonexistent for the mentally retarded, then the label at the same time, will prevent him from both getting special services and going into regular classes. What is at issue here is not simply a practical question of whether a given school system has certain kinds of services. A crucial theoretical-epistomological issue centers around the connection between language and action. Human behavior does not lend itself to absolute descriptive labeling. A child should not be labeled retarded or nonretarded depending merely on the behavior he displays, and disregarding social-cultural context, peer behavior, and physical factors. Labeling must be relativistic and pragmatic. The question, "What good will it do?" takes precedence over, "Is it true?" Labels can then become bridges between needs and services.

Recently Reported Programs

My intensive review of the formal (journal articles and books) and informal (locally reproduced and ERIC materials) literature has not revealed integrated efforts in the early childhood education of

children with mild and moderate disturbances. However, informal publications in this area are beginning to increase in number and variety and suggest that already there are trends toward dealing with the invisibility of the problem. These trends have been closely linked with the recognition of situational variation (discussed in the preceding section) and have been expressed in a report of a symposium on classifications systems for childhood disturbances. In this report, Eisenberg (1970) explicitly recognized environmental effects by discussing a taxonomy that is based on interactional concepts. Although it is still at a very tentative stage, it suggests that neuroses and personality disorders are linked to social interactions above and beyond initial parental child-rearing activities. Therefore, such disorders can best be described for children who are socially involved with other children and adults.

Intervention Through and with Parents

This kind of thinking about early childhood disturbance has led in several principal directions which are just beginning to appear in the early childhood and special education literatures. A considerable number of programs have concentrated on working with parents, either in clinical situations or directly in the home, as a vehicle for diagnosis and treatment. In a program in Michigan, a child guidance clinic offered a 10-week course to teach mothers to identify and deal with the potentially harmful behaviors and interactions of their preschool children (Cary & Reveal, 1967). DeHirsh (1970) attempted to restructure mother-child interaction patterns by using experts to teach parents how to teach their children.

In another program, conducted through the League School in Brooklyn, New York, the object was to strengthen parents' self-concepts so that they would be better able to deal with their severely disturbed children in an interactional context. (Doernberg, Rosen, & Walker, 1970). Another study indicated that parents from lower socio-economic levels harbor feelings of futility about dealing with institutions, but these feelings do not seem to correlate with their children's achievements. The sense of powerlessness about decision making seemed to be shared with the children and contributed to the difficulty of accepting services. The problem led to an intervention program that tried to make parents more aware of their power in decision making, specifically in regard to the operation of their children's educational programs.

At Michigan State University, the underlying theme of direct treatment to parents rather than children pervades the teaching model. The preschool served as a data-collecting center where the behaviors of children were described and interpreted for parents (Meicer, Fritz, & Burroughs, 1969).

The emphasis on dealing with parents rather than children is curious and certainly noteworthy. It may be a reflection of an evolving pragmatism which is not apparent in the research literature but which practitioners have become more and more attuned to. On the other hand, it may simply reflect the elusiveness of early childhood disturbance, which has resulted in amorphous classification systems that certainly do not lend themselves to carefully developed treatment programs. Still a third possiblity stems from the widely held view that children are neither educable nor treatable until they are of school age. Therefore, it follows, it is preferable to deal with parents, who apparently are of treatable age. In any case, one would certainly prefer to see programs that do not depend upon a principle of exclusiveness in either theory or practice for dealing with behaviors that are not subject to consistent definition and prediction.

Roles of Teachers

A second major area of interest in the literature relates to teacher training and the reassessment of the responsibilities of teachers, both in and outside of school settings. Taylor (1969) described the role of teachers in therapeutic preschools as central and dynamic. Teachers' actions should serve as models for mothers in order to improve communications between mothers and their children. One strategy that has been used to sensitize preschool teachers to disturbing behaviors of children, developed at Columbia University, involved the use of rating scales as vehicles for training teachers, with teachers' ratings of children's behaviors compared to ratings of observers (Bilsky, 1970).

Braun and Lasher (1970) described the development and implementation of a training program geared specifically to preparing teachers to work with disturbed children. One study connected to this program (Lasher, Holzman, Rotberg, & Brain, 1970) focused on teaching style and observation as a means of both identifying and dealing with disturbed behaviors and as a central strategy for training. However, despite enormous energy and talent, the training programs have not survived. Programing for children has not caught up to the ideas and energies that are productively available to the professional community.

Identification

One study in New York addressed itself to the problem of recognition (Kastenbaum & Holmes, 1969). The study was carried out at a low-income housing project in connnection with a day-care center that served as a referral agency for children whose behaviors were not severe enough to preclude involvement in the day-care program, and for children with more severe problems. Psychotic and autistic children were not included in this project; they were referred out for private treatment. The children, aged 4-5, exhibited symptoms of withdrawal, immaturity, overcompliance, habit disorders, hyperactivity, and hyperaggression. The focus of the intervention program was on interpersonal interactions, which were evaluated by psychiatrists, psychologists, and social workers who dealt directly with parents. The experience involved group play therapy in addition to day-care center participation; the therapy consisted of two one-hour sessions per week. The critical factor in this study was the specific convergence of programmatic and clinical efforts to serve a total preschool population. Aside from our work (Garfunkel, 1970a), I have been unable to locate reports of other such comprehensive efforts.

Other scattered efforts have been made to study and intervene with young children with social and emotional problems but, clearly, these efforts are just beginning to take on a form that connects the developmental and educational literatures. Faust (1968) studied the social and emotional behaviors of Head Start children, which she compared to the similar behaviors of middle-class children. These efforts have been repeated in fragmentary ways in research efforts over the last five years, but without programmatic implications. Recently, explicit efforts have been made at the University of Oregon (Walker, Note 4) to apply operant principles to dealing with early childhood disturbances. Such principles have been used on a limited basis with severely disturbed preschool children and older children and adolescents, but are not a part of any extensive programmatic efforts at the present time.

Final Statements

It is the contention of this paper that problems associated with the selection and education of emotionally disturbed preschool children have not been attended to, except for very limited samples. On the surface, this observation is related to (a) the limited and biased samples of children in preschool programs, (b) an inadequate language for describing early childhood disturbances, and (c) cultural factors related to recognizing and dealing with disturbance. A deeper look reveals that these factors are a result of the generally low priority given by the developing educational system to preschool problems in general and, more specifically, to preschool children with disturbances and other disabilities. This bias is particularly true for rural and inner-city areas. The implication of this state of affairs is that it is premature to place undue emphasis on existing developmental theory and data until children who are studied more adequately reflect the dimensions and degrees of behavioral disturbance that exist in the preschool-age child population. The use of models that are based on either developmental studies of highly selected middle-class children or clinical studies and experiences with severely disturbed children will serve to widen the gap between theory and practice and will leave most parents and teachers to n gotiate education and treatment for themselves.

As we move more specifically into developing models for describing and dealing with disturbance, it is crucial that situational variation be closely studied and provisions be made for programing that will permit observations to describe and manipulate such variation. Only then will case studies and resulting inferences have meaning for teachers.

The danger that a condition of disturbance will be artificially created in the minds of parents, teachers, and children is a risk that must be taken, lest we continue to ignore the development of specific programs of prevention. The establishment of programs and personnel will focus attention on what we contend is presently a hidden problem. The organization of preschools with respect to sample heterogeneity, clinical components, recruitment procedures, and programing will be a necessary step, and it is beginning to be taken in connection with a few community mental health programs and a very few public school programs. Nevertheless, preschool teachers are ill-prepared for such a development, and the effect of current teacher training and program practices is to obscure the problem by developing procedures and explanations that encourage everyone concerned to feel and act as if all the children will either grow out of their problems in the natural course of events, or that they are so severely disturbed that they will not change. There is little or no middle ground.

Our bias about placement is that most disturbed children should probably be in regular classes, and regular classes should include children with disabilities: They need each other. The important issue--that while some disturbed children are presently in regular classes many have been excluded as not being ready for school--has been discussed. In either case, there is a monumental insensitivity to the possiblity that prevention might depend on early recognition--in this case, prevention can be limited to the immediate environment and the school year. One does not prevent what is going to happen without dealing with what is happening in the present.

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